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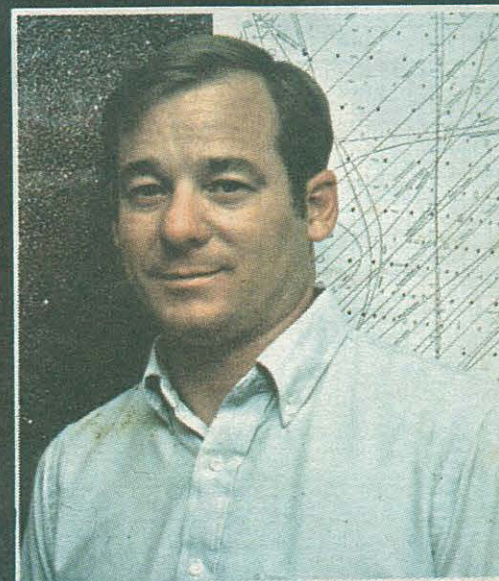
July, 1987

Volume 6, Number 7

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# MONITORING TIMES

A Publication Of  
Grove Enterprises, Inc.



"Skyline" host David Rosenthal

## MT in Space

Apollo 11, the first manned lunar landing mission, awaits launching at Cape Kennedy in 1969.

Photo by Wayne Mishler

★ **Satellites You Can Hear**  
by Larry Van Horn

See Page 4

★ **MT Interviews "Skyline" Host David Rosenthal**

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★ **Tips for Summer Listening**

by Jock Elliott

★ **Introduction to the VHF/UHF Spectrum**

by Bob Grove

★ **Computer Interface for the FRG-9600**

by Bruce Frederick

**Magne Tests  
The Sony  
ICF-7700**



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## From the Editor

Considering how few people listen to pirates, it's amazing the cloud of dust the topic raises whenever it's brought up. Because of their low power and erratic schedules, they're about as easy to pick up as Chinese regionals at high noon.

In this month's issue of *Monitoring Times*, columnist Scott McClellan presents a proposal by ex-pirate Bruce Quinn to the U.S. Federal Communications Commission to, essentially, legalize pirate broadcasting. Quinn proposes that certain parts of the AM band and virtually all of the commercial FM broadcast band be opened to stations of ten watts or less making it possible for "Every dreamer who seriously wants a station...to get one."

"Many people," he continues, "are into broadcasting simply because it is lucrative. It is about time that people who love radio, want to serve their community, and happen not to be rich, be given a chance to participate."

The idea, while romantically appealing, is appalling, similar to saying, "let's open the airspace--from 25,000 to 30,000 feet over the northeast and over the rest of the country from 5,000 to 10,000 feet--to anyone who has ever seriously dreamed of flying a home-built, under-\$1,000 airplane. There are people," the argument would continue, "who are into flying simply because it's lucrative. It's about time that people who love airplanes, want to ferry people about for fun, and happen not to be rich enough to afford a jumbo jetliner, get a chance at the skies."

The result would be that there would soon be more planes in the sky than flies around a carcass on a hot summer day. Commercial radio, too, under Mr. Quinn's proposal, would soon be filled with the annoying buzz of a dense cloud of swirling flies.

Sure, there's going to be a few genuine, well-intentioned people like Bruce Quinn who want to build local stations that can play tunes of his choice and local public service announcements for the Firehouse Ladies Auxiliary all day. But for the most part, the only thing we'd gain by these public access stations is programming as appealing as those on public access cable stations and de-facto shortwave pirate bands.

One need look only as far up the dial as the CB bands to see what similar deregulation did to an otherwise-serviceable portion of the radio spectrum. The same thing would undoubtedly happen to the AM and FM bands if Mr. Quinn's proposal was accepted.

## Columnists Wanted!

As *MT* continues to grow, so does our need for good writers. At the present time, several monthly columns are being prepared here at *MT* headquarters; we would be pleased to assign them to competent writers.

Columns in search of qualified writers include **SCANNING**, **THE FEDERAL FILE** (federal and military monitoring), and **RTTY** (bimonthly).

If you feel that you have the 'right stuff' to take on the responsibility of one of these columns and can follow strict deadlines, contact the publisher, Bob Grove, at *Monitoring Times*, PO Box 98, Brasstown, NC 28902.

Be sure to include a short resume of your credentials with your initial inquiry.

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**On the Cover:** Apollo II poised for launch Cape Kennedy, 1969. Photo by Wayne Mishler. Ins Dave Rosenthal, host of Radio Earth's "Skyline" Cover design by Owassa Graphics, Murphy, NC

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# SATELLITES YOU CAN HEAR

by Larry Van Horn

## Part one of two parts:

### Satellite Frequency Allocations

For me the lust began more than 20 years ago, when I first began reading *Popular Electronics* and *Electronics Illustrated*. I sent in reader service cards, sent off for catalogs and I devoured every ad and daydreamed in school about owning a big, multiknob shortwave receiver. *I wanted a shortwave radio!*

By reading these electronics magazines I found out that I could get closer to the one thing I loved the most, space. To me, space was tomorrow-today. But my today seemed like an eternity away.

Eternity ended Christmas 1965 and my dream was fulfilled. To a youngster of 13 even a used Hallicrafters S-120 receiver was a machine of wonder and amazement. After the antenna went up and the rig was turned on for the first time, the warm glow of the Hallicrafters five tubes convinced me that I was going to hear what I wanted to hear, satellites.

Back in those days satellite signals on shortwave were plentiful. Columns in the major electronic magazines gave numerous HF radio frequencies for satellites both US and Russian. There was even voice channels on shortwave to listen to.

Since those early days I have logged more than my share of satellite and manned spacecraft signals. A lot of time has been spent in front of many different radios I have had over the years seeking out the weak telemetry of a geostationary satellite or voices from manned spacecraft.

### Satellite Frequency Spectrum

One of the first questions the new satellite monitor must answer is "what type of satellites do I want to listen to?" This will then determine the frequency range and receiving equipment needed to hear the target satellites.

To give you a better understanding of what satellite frequencies are available, what follows is a very simple synopsis of satellite frequencies that can be heard with easily obtainable equipment. My book *Communications Satellites* gives a more detailed, specific list of frequencies and newcomers are encouraged to obtain the new third edition of the book when it is released this fall.

### HF-3 to 30 MHz

While most activity on shortwave has long ago moved higher in frequency, two distinct areas of the spectrum remain. These areas are used primarily by amateur radio satellites

and Russian spacecraft. The frequency spectrum from 29.3 to 29.5 MHz is used by Soviet amateur spacecraft of the RS series for downlinks. The listener will hear CW, RTTY, and SSB voice transmissions. These satellites represent the best opportunity for the beginner to monitor satellites. Orbits are predictable and information on these satellites is widely available.

The other frequency spectrum in the HF spectrum also contains Russian satellites. Listeners will find the majority of the activity in the 19.0 to 20.1 MHz range. The signals will consist of data telemetry from a variety of Soviet orbiting spacecraft. No voice will be heard.

### VHF Low Band - 30-50 MHz

This area of frequencies will yield precious few satellite signals. Currently the only known activity centers around 40 and 41 MHz from the Soviet Interkosmos series of satellites. There have been some unidentified signals in this range that could be coming from Soviet satellites so listeners might want to watch for data signals with Doppler shift and report what you hear to *Signals from Space*. I know of no voice activity in this range.

### 6 Meter Ham Band

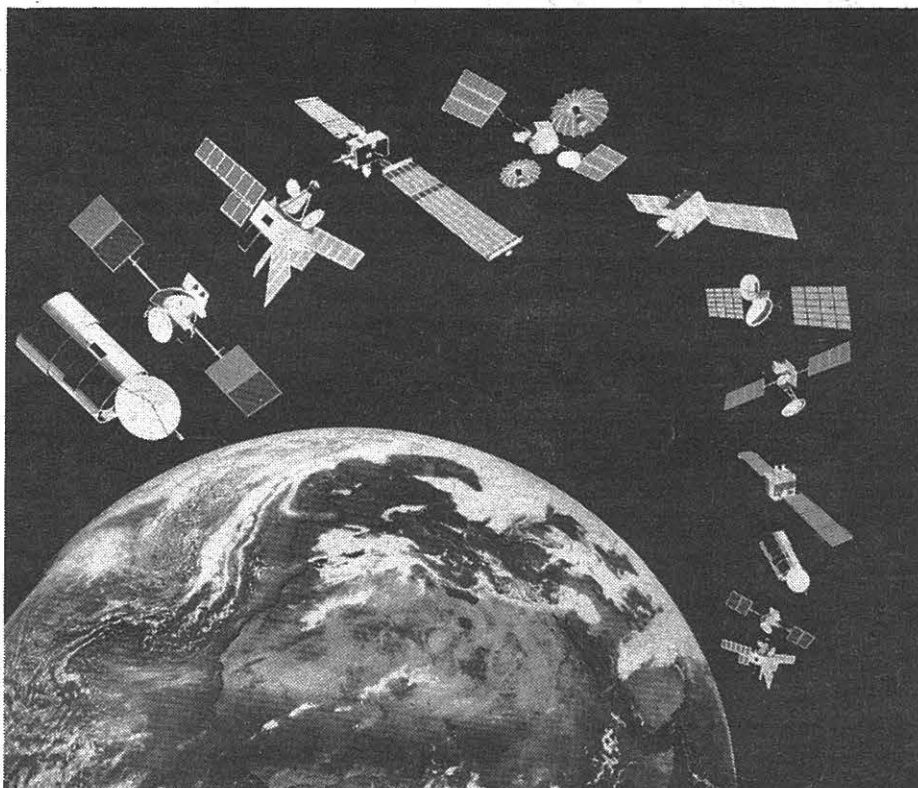
The Russians have definitely invaded the 6 meter amateur band and their satellites CW beacons have been discovered in the 51.0 to 52.0 MHz range. These signals are coming from some of their most sensitive satellites and there could be more yet to be discovered signals in this range of frequencies.

### VHF High Band - 135.555 to 144.000 MHz

This range of frequencies include the 136-138 MHz satellite band. For years satellites have filled that spectrum with all types of telemetry downlinks. One of the few known voice channels in this range comes from ATS-3 downlink, 135.555 to 135.650 MHz. Russian voice from the MIR and Salyut 7 spacecraft are also located in this band. Transmissions can be monitored via narrow band FM. Weather satellite FAX signals are widely heard in this range and can readily be demodulated. Most of the rest of the satellite signals consist of telemetry data signals.

### 2 Meter Ham Band

The frequency spectrum from 145.8 to 146.0 MHz supports numerous



*"It is difficult to say what is impossible for the dream of yesterday is the hope of today and the reality of tomorrow". Robert Goddard, The Father of Modern Rocketry*

amateur radio satellite downlinks. CW/ RTTY, Packet and SSB voice transmissions are the major modes. The Uosat satellites stand out in this range as their 145.825 MHz can be widely heard on the simplest of equipment and the signal mode is narrow band FM. These satellites even carry digital voice downlinks.

### 149.9-150.1 MHz

This frequency range consists mainly of U.S. and Russian navigation satellites. The satellites send out telemetry only. I have one report of a possible voice downlink from the ATS series of satellites on 149.999 MHz.

### 150.1 - 225.0 MHz

I only know of sporadic activity in this range, mainly from Soviet spacecraft. Most of these downlinks are data and use wide band FM 300 kHz wide type transmissions.

### MilAircraft 225.0 - 400.0 MHz

This is probably the richest region for satellite signals today. Most of the satellites that operate here are military. Both the Russians and the U.S. operate satellites in this band. The U.S. space shuttle also has voice downlink in this area. Just about any mode can be heard in this range. Satellites heard here will be a mix of geostationary and orbiting types. Listeners to this area of the spectrum would be wise to equip themselves for all modes to take full advantage of the monitoring opportunities.

### 400.0 to 1300 MHz

Activity in this area is sporadic and consists mostly of wide band and

narrow band telemetry signals. Some of the Soviet spacecraft activity can be best heard using single sideband receivers.

### 1300 - 3,000 MHz

There are some very rich satellite signals in this area of the spectrum for the non-voice satellite experimenter. Easiest to decode are from the geostationary weather satellites sending facsimile signals to ground stations. Beginners would do well not to venture into this range as it is definitely an area for experimenters only.

### 3,000 - 5,000 MHz

This is the domain of the TVRO satellites. All forms of voice, video and data channels will be present. Equipment costs have come down over the last few years and all of the satellites will be geostationary. This makes the tracking equation very easy. There is a lot of activity here and the satellite monitor equipped to hear this range will find it rewarding.

### 5,000 MHz - above

With the exception of the KU-TVRO band, (equipment is readily available), all of the activity is for the experimenter only. A lot of frequencies exist above 5,000 MHz and the move over the last few years had been toward higher frequencies. I see that trend continuing as available spectrum space becomes more crowded.

### Doppler Shift

The Doppler Shift is the single most important indicator of a satellite signal. If the satellite is an orbiting

type satellite as opposed to a geostationary, the downlink will exhibit Doppler Shift.

If you were standing alongside a train track with a train approaching and heard the train blow its whistle, the pitch of the whistle would appear to decrease. However, if you were on the train when the whistle blew, the pitch would appear to remain constant. This is because the frequency of the sound that you hear depends on the relative motion between the source (whistle) and you (observer).

As a passenger on the train, you move along with the source so the frequency will remain constant. However, if you're on the side of the track, the distance between you and the source is constantly changing. Therefore, you will hear a changing audio frequency. The phenomenon is known as Doppler Effect, named after Johan Doppler (1803-1853). While radio waves are very different from radio sound waves, they do exhibit a similar effect. A satellite approaching you will exhibit an up Doppler (frequency appears to be

moving up), while a satellite moving away from your location will exhibit a decrease of down Doppler. Geostationary satellites do orbit the earth but, due to the fact that they are placed in an orbit that matches the earth's rotational speed, they do appear to remain stationary over one spot. The result is that there is no apparent difference in motion between the observer and the satellite and hence no Doppler Shift of the downlink frequency.

If you hear a change of pitch on the frequency that you suspect is satellite, you can be confident hearing a satellite downlink. Doppler Effect is a good indicator of satellite signal.

*Next month I'll conclude by digging little deeper for the beginner; now that you have an idea of what is available and where it is, I will discuss receiving antennas that are capable of receiving satellites.*

## ACTIVE SATELLITE FREQUENCIES

by Bob Grove

Here at MT headquarters in Brasstown, North Carolina, we scan the VHF and UHF satellite frequencies virtually daily to see what new activity we can uncover. The receiver is an ICOM R7000 and the antenna is a Grove Scanner Beam with a Grove PRE-3 preamplifier.

The vast majority of downlinked signals are non-voice, a mix of buzzes, hisses, swishes, and other noises indicating the presence of data, telemetry and scrambling. When voices are heard they are usually in wideband FM mode with a rare single-sideband relay thrown in.

F. MHZ	USER	MODES	IDENTIFICATION	F. MHZ	USER	MODES	IDENTIFICATION	F. MHZ	USER	MODES	IDENTIFICATION
135.575	US	FM voice	ATS-3	244.085	USN	Digital	FLTSATCOM	260.775	USN/AF Data		FLTSATCOM
135.600	US	FM voice	ATS-3	244.090	USN	Digital	FLTSATCOM	260.800	USN/AF Data		FLTSATCOM
135.625	US	FM voice	ATS-3	244.095	USN	Digital/SSB	FLTSATCOM	260.850	USN/AF Data		FLTSATCOM
136.380	NASA	Data	Weather	244.100	USN	Data	FLTSATCOM	261.450	USN/AF Data		FLTSATCOM
	USAF			244.110	USN	Digital	FLTSATCOM	261.500	USN/AF FM voice		FLTSATCOM
	Canada			244.145	USN	Carrier	FLTSATCOM	261.525	USN/AF Data		FLTSATCOM
	China			244.155	USN	Carrier	FLTSATCOM	261.550	USN/AF Digital		FLTSATCOM
136.410	US	Data	Intelsat	244.160	USN	Carrier	FLTSATCOM	261.575	USN/AF Data		FLTSATCOM
	Canada			244.165	USN	Data	FLTSATCOM	261.600	USN/AF FM voice		FLTSATCOM
136.440	NASA	Carrier	Intelsat, OAO	244.170	USN	RTTY	FLTSATCOM	261.625	USN/AF Tones		FLTSATCOM
136.500	NASA	Data	ATS, Nimbus	244.175	USN	Data	FLTSATCOM	261.650	USN/AF FM voice		FLTSATCOM
136.713	Japan	Data	Tansei, Kyokko	244.178	USN	Data	FLTSATCOM	261.675	USN/AF FM voice		FLTSATCOM
136.770	NASA	Data	ITOS, NOAA	244.180	USN	Data	FLTSATCOM	261.700	USN/AF Data		FLTSATCOM
	USAF			244.185	USN	Digital/RTTY	FLTSATCOM	261.725	USN/AF Data		FLTSATCOM
	China			244.190	USN	Digital	FLTSATCOM	261.775	USN/AF Data		FLTSATCOM
	US			244.195	USN	Digital	FLTSATCOM	261.825	USN/AF Data		FLTSATCOM
137.040	USAF	Data	Ferret, OTS	244.200	USN	Carrier	FLTSATCOM	261.875	USN/AF Data		FLTSATCOM
	NASA			244.210	USN	Digital	FLTSATCOM	261.900	USN/AF Data		FLTSATCOM
	ESA			248.900	USN	Data	MARISAT	261.950	USN/AF FM voice		FLTSATCOM
137.170	France	Data	Marots, HCMM	249.100	USAF	Carrier	MARISAT	262.050	USN/AF FM voice		FLTSATCOM
137.180	?			249.150	USN	Data	MARISAT	262.100	USN/AF FM voice		FLTSATCOM
137.200	ESA	Data	Weather telemetry	249.200	USN	Data	MARISAT	262.125	USN/AF Data		FLTSATCOM
137.400	US	Data	SMS-2, Meteor	249.300	USN	Carrier	MARISAT	262.175	USN/AF Data		FLTSATCOM
	USSR			249.400	USAF	Data	LES	262.200	USN/AF Data		FLTSATCOM
137.410	USAF	Data	Explorer, Rohini	249.550	USAF	FM voice	LES	262.225	USN/AF FM voice		FLTSATCOM
137.420	India	Data	Rohini	249.700	USAF	Data	LES	262.250	USN/AF Data		FLTSATCOM
137.440	India	Data	Ryabhata, Bhaskari	250.450	USN	Data	FLTSATCOM	262.275	USN/AF Data		FLTSATCOM
137.460	?			250.550	USN	Data	FLTSATCOM	262.300	USN/AF FM voice		FLTSATCOM
137.500	US	Data	Weather	250.650	USN	Data	FLTSATCOM	262.375	USN/AF Data		FLTSATCOM
137.560	UK	Data	UK-6	251.850	USN	Data	FLTSATCOM	262.400	USN/AF Sweeper		FLTSATCOM
137.570	NASA	Data	Explorers	251.950	USN	Data	FLTSATCOM	262.425	USN/AF Data		FLTSATCOM
137.620	NOAA	Data	Weather	252.020	USN	Data	FLTSATCOM	262.450	USN/AF Data		FLTSATCOM
137.770	NOAA	Data	Weather	252.040	USN	Data	FLTSATCOM	262.475	USN/AF FM voice		FLTSATCOM
137.850	USSR	Data	Weather	252.050	USN	Data	FLTSATCOM	263.075	USAF Data		AFSATCOM
142.417	USSR	Voice FM	Salyut station	252.150	USN	Data	FLTSATCOM	263.500	USAF Data		AFSATCOM
143.625	USSR	Voice FM	Mir station	253.550	USN	Digital	FLTSATCOM	263.600	USN/AF Data		FLTSATCOM
149.910	USSR	Data	Cosmos navsat	253.650	USN	Digital	FLTSATCOM	263.650	USN/AF Data		FLTSATCOM
149.940	USSR	Data	Cosmos navsat	253.750	USN	Digital	FLTSATCOM	263.675	USN/AF FM voice		FLTSATCOM
149.988	US	Data	Navsat	253.850	USN	Digital	FLTSATCOM	263.700	USN/AF Data		FLTSATCOM
150.000	USSR	Data	Cosmos navsat	254.150	USN	Data	MARISAT	263.725	USN/AF Data		FLTSATCOM
150.012	US	Carrier	?	255.250	USN	RTTY	FLTSATCOM	263.750	USN/AF Data		FLTSATCOM
150.030	USSR	Data	Cosmos navsat	255.350	USN	Data	FLTSATCOM	263.800	USN/AF Data		FLTSATCOM
243.727	USAF	RTTY/FAX	AFSATCOM	255.450	USN	Digital	FLTSATCOM	263.875	USN/AF Data		FLTSATCOM
243.730	USAF	Data	TACSAT	255.550	USN	Data	FLTSATCOM	263.900	USN/AF Data		FLTSATCOM
243.855	USN	On/off	Leasat	256.850	USN	Data	FLTSATCOM	264.000	USN/AF Data		FLTSATCOM
243.860	USN	On/off	Leasat	256.950	USN	Carrier	FLTSATCOM	264.025	USN/AF Data		FLTSATCOM
243.875	USN	Data	Leasat	257.050	USN	Digital	FLTSATCOM	264.050	USN/AF Data		FLTSATCOM
243.887	USAF	Data	SDS/TACSAT	257.150	USN	Data	FLTSATCOM	265.250	USN Digital		FLTSATCOM
243.900	USN	RTTY/on/off	Leasat	257.550	USN	On/off	MARISAT	265.350	USN Digital		FLTSATCOM
243.910	USN	Data	Leasat	258.350	USN	Data	FLTSATCOM	265.450	USN Digital		FLTSATCOM
243.960	USN	Data	FLTSATCOM	258.550	USN	Data	FLTSATCOM	265.550	USN Data		FLTSATCOM
243.975	USN	Data	FLTSATCOM	258/650	USN	Digital	FLTSATCOM	266.850	USN Data		FLTSATCOM
244.000	USN	Data	FLTSATCOM	259.700	NASA	AM voice	Space Shuttle	266.950	USN RTTY		FLTSATCOM
244.010	USN	Data	FLTSATCOM	260.350	USN/AF Carrier		FLTSATCOM	267.050	USN Data		FLTSATCOM
244.045	USN	RTTY	FLTSATCOM	260.400	USN/AF Data		FLTSATCOM	268.250	USN Data		FLTSATCOM
244.055	USN	RTTY	FLTSATCOM	260.425	USN/AF RTTY		FLTSATCOM	268.350	USN Digital		FLTSATCOM
244.060	USN	RTTY	FLTSATCOM	260.500	USN/AF Data		FLTSATCOM	268.450	USN Data		FLTSATCOM
244.065	USN	RTTY	FLTSATCOM	260.525	USN/AF Data		FLTSATCOM	269.750	USN Data		FLTSATCOM
244.070	USN	RTTY	FLTSATCOM	260.700	USN/AF Data		FLTSATCOM	269.850	USN FM voice		FLTSATCOM
244.075	USN	RTTY	FLTSATCOM	260.725	USN/AF Digital		FLTSATCOM	269.950	USN FM voice		FLTSATCOM
244.078	USN	RTTY	FLTSATCOM	260.750	USN/AF Data		FLTSATCOM	296.800	NASA AM voice		Space Shuttle
244.080	USN	RTTY	FLTSATCOM								

# Tips for Summer Listening

by Jock Elliott

"I'm gonna take my case to the United Nations...  
'cause there ain't no cure for the summertime blues..."

The Who

Is the summertime really blue for the DXer? Or is there still a glimmer of hope that after June 21, radio can still be "the most fun you can have sitting down"?

When faced with that question, Larry Magne, editor of *Radio Database International*, said, "If anyone can answer the question of summer DXing, it's Don Jensen. Jensen can DX in his sleep, using his toes."

"I'm not going to pretend the summer is a great time for the real hardcore DXer," Jensen says, "but in summer you can find rare but good openings in the lower tropics -- 60 and 90 meters - where you can get some really good trans-equatorial stuff."

"From here in the midwest, we get openings into East and South Africa in the evenings and into South America, the Brazilian stations. From the west coast," continues Jensen, "you might be able to hear Indonesia."

The down side of all this summertime promise is that the openings are often degraded by absolutely awful atmospheric noise. Says Larry Miller, "the problem is that often the only DX you get is thunderstorms. You can hear thunderstorms for thousands of miles anywhere along the signal path."

Just about every DXer we talked to agreed that while conditions may not be as nice as they are in winter, there are still plenty of opportunities to enjoy the hobby.

"One way to beat the summertime blues," comments Magne, "is to take advantage of the good weather and get out of the house. Take your portable out into the woods and see what reception is like when you get away from all the man-made noise like power lines."

"Or mount a DXpedition," adds Jensen, "and go all out. Get yourself to the top of a mountain. Throw a wire over a pine tree and see what you get."

Gerry Dexter, contributing editor for Popular Communications and author of several shortwave books suggests committing to a special project. Dexter feels that the key to establishing a very long term involvement with DXing is to have a wide variety of interests and then to divide them up into a bunch of different tasks, areas, or projects. In that way, when one area slows down for a while, you

can maintain interest by becoming more active in another. Dexter should know; he has been DXing almost since childhood."

"Say you have only one area of interest, like collecting QSL cards," says Dexter, "then you have a potential problem. Because while you might be able to fill your mailbox with QSLs every day for a few weeks, once you get up to 150 or 160, it's going to slow down -- maybe a QSL every several months. It's hard to stay interested when things grind down like that."

Indeed, special projects may just be what the doctor ordered for opening up some new areas of interest for you this summer. Here's a few examples:

- Specialize in a band for the summer and see how many countries or stations you can hear and/or verify. Get out the issue of *Monitoring Times* with Larry Miller's spectrum occupancy chart and start working to fill it in.

- Hearing and verifying all the Voice of America relay sites.

- Hearing and verifying the wide variety of Soviet stations. Sure, Radio Moscow's North American and World Services are easy, but how about Radio Station Peace and Progress? Or better yet, some of the Soviet regional stations like Radio Alma Alta and the Soviet maritime stations such as Radiostantsiya Tikhii Okean (for fishermen at sea in the Pacific)?

- Still not stumped? The Soviets broadcast in some 80 languages. Get tough with yourself and try bagging all of them. When was the last time you heard something in the Foul, Oriya or Quechua languages?

- Leave the international broadcast bands altogether and listen to something entirely different like the ham bands or utilities. Dozens of MT readers have reported tuning in on everything from sinking ships to plane hijackings. And a few may have even saved some lives!

- Fill in the holes in your DX library. Buy a few books on a shortwave subject that tickles your fancy and study up on it.

Miller is especially enthusiastic about the last idea. "For the first time in years, there is a really impressive and wide ranging selection of hobby books out there. We're no longer limited to the traditional 'handbooks'; Hank Bennett/Harry Helms *Shortwave Listener's Handbook*" and the *World Radio TV Hand-*

*book*. Now we've got *Radio Database International*, the fantastic *Shortwave Radio Listening with the Experts*, the entire series of Tiare Publications (*Secrets of Successful QSLing*, *Unos Dos Cuatros*, etc.) individual works by independents, and much, much more."

Another interesting special project would be to start a tape library. "People often think of ham radio or CB when they hear the word 'DXer'," says Jensen, "but if they could hear what you have heard, it all becomes clear to them very quickly."

A tape library might include some interesting programming, perhaps a collection of IDs and sign-ons, and some exotic music. Play it for your friends and relatives, and it might even get them interested in DXing. Or play it to the Boy Scouts or other civic groups that might have some interest.

And, although it sounds less than exciting, summer is the best time for the DXers to do some general housekeeping chores -- especially antenna installation and maintenance.

"It comes as no surprise that antenna manufacturers sell the most antennas during the dead of winter," says Miller. "Sure, winter is when everyone's hot on DXing; that's when everyone thinks about their antennas. But hard as it is to remember on a sweltering, 90 degree day, it's also a time of sub-zero temperatures and icy roofs."

Jensen concurs. "You ought to check your antenna at least once a year to make sure it isn't grounded anywhere, that the insulators are not cracked, and that the feedline, supports and stand-offs are in good shape." Jensen speaks from personal experience. He had to repair his antenna in the middle of December last year.

While on the subject of antennas, Jensen adds that summertime is thunderstorm time. "It's a good time to install a Transitrapp. I don't honestly know if anything can protect your equipment from a direct lightning strike on your antenna, but a few years ago I lost a couple of very sensitive pre-selectors to a bolt about a quarter of a mile away. Now I use a Transitrapp and haven't had any lightning problems since."

Magne adds that general DX housekeeping, though no more appealing than housekeeping in the

rest of the bungalow, is also important: fixing up, building shelves, and doing whatever is needed to make serious listening a little easier and enjoyable. If your logging system and QSLs are in disarray, you might want to consider investing some time getting them in shape, he says.

But why bother with all this preparation?

Jensen puts it this way: "SWLs are like fisherman. A program listener is like the guy who wants to catch a panfull of fish to eat. But a DXer is like a sport fisherman -- he wants to catch a tarpon on a fly rod, and to do that, he needs to know where the tarpon are, when they feed, and what kind of bait they like."

To extend Jensen's analogy further, while you aren't limited to putting together your DX station wish list for next winter or even the tips mentioned above, it makes more sense to make sure your fishing tackle is in good repair before they start biting.

The most disappointed people in DXing are often those who spend \$1,500 on an absolutely top-of-the-line receiver and then find out that it doesn't magically turn them into a super DXer. Planning isn't always enjoyable, but it's often very, very productive.

## Summertime Reading



**Summertime.** It used to be a word that shortwave radios dreaded. Because when the warm weather rolled around, they knew where they'd be going for the next four months: to the top shelf of the hall closet. And that's no way for a radio that's served you so well to spend its vacation.

It's not that people *wanted* to board their radios at Camp Closet, it's just that it was so impractical to take them along. Somehow, a 40 pound piece of equipment filled with dozens of smoking, red hot tubes and trailing a DC power cord and a 600 foot antenna just didn't seem appropriate to take for a walk on the beach.

Today, all that has changed. Svelt yet powerful young portables have been popping up at all the glamour spots of the rich and famous. Sitting on the beach at midnight, taking in Radio Tahiti. At Hollywood parties, set to France. At cookouts, providing Australian pops for a crowd munching shrimp just off the barbie. There's no limit to the fun you can have when the world is at your fingertips.

But what about fall when the *serious* DX fun begins? How can you be sure that you'll be ready for all the challenges and excitement to come when that warm weather starts to take on an autumn chill and most DXers really get down on those dials?

There's a lot of ways to prepare. Some of them can be found on the previous page. Yet another way is to spend some time boning up on the hobby. Fortunately, there's a wealth of good, easy-reading books now available to the shortwave listener.

Here's a list of what we feel are some of the best books to come out of the last season. While the list is by no means all-inclusive, there should be something to whet the appetite of virtually any radio monitor and any level of expertise.

### Utility QSL Address Guide Authors: Symington and Henault

*QSL Address Guide* is not really innovative. It's just long overdue. The book fills a definite void in the utility monitoring community by providing addresses for those people who enjoy QSLing. It is, to the best of our knowledge, the only generally available book of its kind on the subject.

### Shortwave Radio Listening with the Experts Author: Various

*Shortwave Listening with the Experts* is undoubtedly the block-buster book of the year. An assemblage of articles by experts of various persuasions, it is a first rate, full coverage book. SWL is really the encyclopedia of the radio monitoring hobby -- a door-stopping 500+ pages and worth its considerable weight in gold.

For the shortwave listening hobbyist, some of the most useful chapters include, "Setting up your Shack," "Antennas for Shortwave Reception," "Purchasing the Right Shortwave Receiver," "Fundamentals of Shortwave Propagation," "Recognizing Languages," "QSLing", and "Tropical Band DXing."

But that's only a few of the chapters. There are 25 in all, and each is written by an expert in the field. It's been said in a number of advertisements this season but it's true. If you buy only one non-frequency book, this is it.



### World Radio TV Handbook Author: Various

The 42 year old "*Handbook*" is still about the only place you can find the real nitty-gritty of shortwave. Where else can you turn if you need the name of the Director General of the Voice of Indonesia? The phone number for Radio Nepal? The transmitter power of Wake Island's AFRTS FM outlet? Or, as the book boasts, "information on reception conditions, time signal stations, and other specialized information." *WRTVH* is comprehensive, but it is clumsy.



### Shortwave Listening Handbook Author: Harry Helms

If *So You Bought a Shortwave Radio* is the beginners book for SWLs, and *SW Listening with the Experts* the encyclopedia, then *SWL Handbook* is the everyman's book.

The problem with *SWL Handbook* is severalfold. First, the book looks like one of those texts you're forced to buy in college -- fairly slim, expensive, dull, and unattractive. Second is that the book, despite the fact it's published by a major house -- Prentice-Hall -- doesn't seem to have been promoted much. And third, Helm's writing style is not all that lively. It's kind of a "just the facts, ma'am" sort of thing. But what it lacks in friendliness it more than makes up for in terms of sheer, bulk information.

Years ago, it used to be Hank Bennett's *Shortwave Listening Handbook* (published by Tab Books and now in its third alleged revision) that was the book that most SWLs cut their teeth on. Today, it should be Helm's book. Those smart enough to overlook the packaging of Helm's book will find it to be the most informative, thorough book on the subject to date.

### So You Bought a Shortwave Radio by Gerry Dexter

If any book has the chance of cracking the shortwave listening market open to the general public, *Bought a Shortwave Radio* is it. It's constructed on the same lines as "So You Bought a Pet Gerbil" or "So You Bought Your First Camera."

It's filled with humorous, primitive drawings, and plenty of basic -- and I do mean basic -- information on shortwave radio. And best of all, it's cheap, about six or seven bucks. *Bought a Shortwave Radio* is a perfect first book for anyone just getting into SWLing and a super gift for the non-SWLing people in your lives that you want to convert into SWLs.

### Radio Database International

September marks the release of the new 1988 edition of *Radio Database International*. And while the annual is only three years old, it's clear that the industry has a new "bible." *RI* is probably the fastest-growing book in the shortwave industry, bar none.

What makes *Radio Database International* unique is the fact that it's not a reference work; it's designed to be used. It's a practical book, arranged by frequency, that allows you to immediately identify any station on the air at any time. Plus, *Radio Database International* is now the only place to get Larry Magne's Annual "Buyers Guide to World Band Radios," the world's most authoritative source of unbiased reviews of shortwave equipment. Simply put, it's a "must have" for anyone who listens to the shortwave broadcast bands.

### Language Lab Author: Various

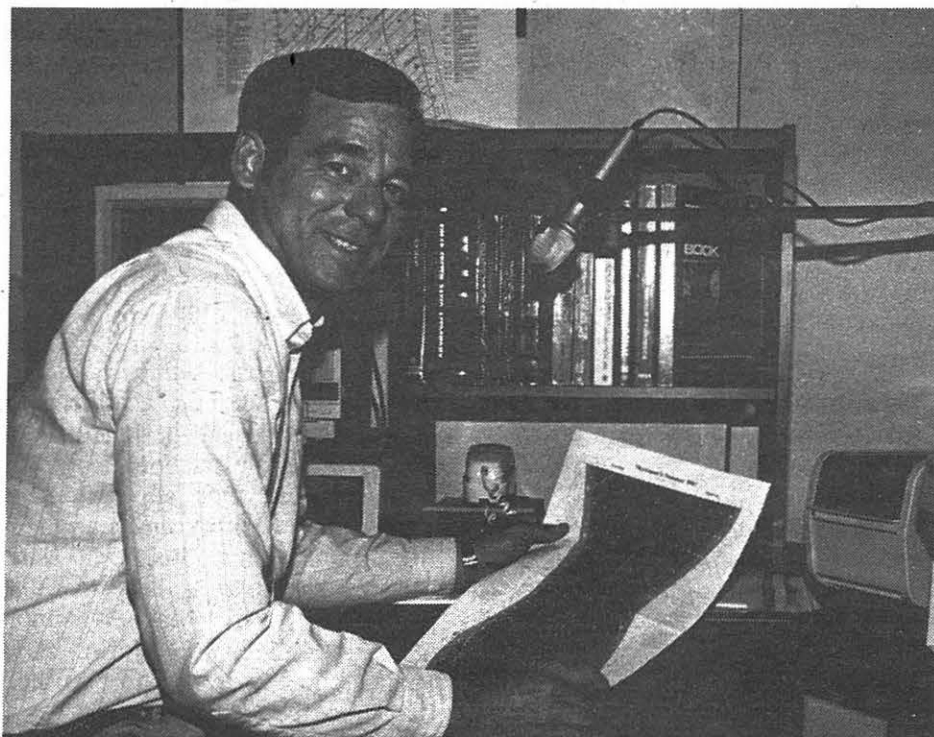
As the shortwave market began to "open up" in 1986/87, innovation became the catchword of the day. And there was probably no more innovative or clever a book as the *Language Lab* series. *Language Lab* works two assumptions. First, that you're interested in collecting QSL cards and second, that you don't speak Spanish, French or Portuguese.

*LL* is a "cheater" book; kind of "language in a kit" with "some assembly required." Here's how it works. Included in each book are hundreds of common phrases used in writing reception reports. And next to each phrase is the foreign language equivalent. As a result, you can simply pick the phrases you need in English, copy down their foreign language equivalent, and assemble a pretty first-rate reception report in the language of the station you're trying to get a QSL card from. There are three books in the series: Spanish, French and Portuguese. Each is about twelve or thirteen dollars and quite definitely worth its price. Your game is QSLing. For non-foreign language speakers, they're invaluable.

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"latest with the greatest"  
Subscribe to MT!

## INTERVIEW

# Dave Rosenthal: A Down to Earth Talk with Radio Earth's Resident Skypilot



**"Hello, and welcome back to another edition of 'Skyline.' I'm Dave Rosenthal, coming to you from China Lake in the Mojave Desert with 'Skyline,' a program of astronomical and new information designed to help you enjoy your sky - no matter where in the world you live."**

If you've ever listened to Dave Rosenthal's astronomy program, 'Skyline', on Radio Earth, you're aware of his style: unbridled enthusiasm. Rosenthal can take a very ordinary night sky and turn it into an easily-understandable whirling carousel of stars and planets. More than one astronomically-uninterested bystander has suddenly found himself standing in the back yard late at night, neck grotesquely twisted upwards, after hearing his fast-paced program.

Rosenthal can catch the attention with his innovation as well. Over the past few months, he's been telling listeners how they can tune in radio waves from the planet Jupiter on their shortwave radios. (He's no kook; you really can.) And he's been known to send his QSL card as computer bit streams over the air, to be picked up and decoded by listeners.

A byproduct of Rosenthal's enthusiasm is his ability to talk. To be honest, this is not an interview; it's a monologue. But don't take that as a put-down. Not only is Dave one of the brightest stars on the shortwave broadcast horizon--he recently had his material featured on Radio Netherlands as well as his twice-weekly slot on Radio Earth -- but he's the kind of guy that you meet, and is so friendly, so unpretentious, so...so... enthusiastic, that you immediately know that this man could be a friend for life. So take a deep breath and prepare to meet Dave Rosenthal.

MT: What is "Skyline?"

**Rosenthal:** "Skyline" is an astronomy program but it's also an adventure program. Each week I try to provide some way of personally exploring some aspect of the universe -- be it astronomically or something else.

"Personal" is the key word here. Few people find *anything* interesting that they don't understand but once that particular obstacle is out of the way, things just get better and better. For lots of things, the basic understanding -- a feel for what's going on -- throws the door open wide and every step from there becomes a new adventure.

Shortwave listeners are already in the adventure business. We're *ready* for that insight that helps us put things we already know something about in a new perspective. What's available on the radio today provides some interesting information but, in many cases, it tends to get buried in propaganda or you have to wade through long presentations to extract it.

By and large, people seem to want and appreciate understandable, high-content material. This is material that provides information that's both interesting and *useful*. This is one of the main reasons why I think 'Skyline' has been so popular.

Another reason is the fact that I talk about things people can go right out and try. In this world of "instant gratification" -- and I've got to admit

that I like it -- there's nothing more fun than hearing an explanation of something and then to be able to go out and experience it for yourself. Well, it can be very rewarding.

MT: One of the successes of Skyline is that it takes a complex topic like the universe and makes it digestible in ten minutes or so....

**Rosenthal:** So many people find astronomy fascinating but, at the same time, they're afraid of it simply because of all the scientific complexity involved. When people take a class or go to some sort of astronomical presentation, more often than not they wind up listening to some highly educated person who may or may not be very effective at communicating. Matter of fact, most academicians tend to overstress the classroom aspect of astronomy --

With 'Skyline' it's the other way. I start with enjoyment of things in the sky. And because I am a DXer, it's easier for me to understand what other DXers are looking for. I live in the real world. I seem to do all the things everyone else struggles through. I can express what I need to in terms people are comfortable with. And because I've got that scientific background, I can express it accurately. There's nothing more irritating than a non-technical broadcaster trying to talk about something technical.

I think my own personal frustrations with listening to this type of reporting was what got me into scientific broadcast journalism in the first place. I knew I could do it better.

MT: But why an astronomy program on shortwave?

**Rosenthal:** Radio people not particularly interested in astronomy get useful information about the sky that ties these two experiences together. Astronomy people who are into radio get even more since they already have some familiarity with what's going on. The key to the whole thing is presenting information that's interesting and useful to the largest segment of the audience.

Another aspect of the 'Skyline' radio adventure is experimentation. I'm always trying one thing or another to demonstrate just how versatile your radio experience can be. Good radio equipment isn't cheap and new ways to use it are pleasant surprises at the very least -- especially when they work!

Using your receiver to monitor Jupiter's shortwave radio emissions turns out to be something not too many people think of but it is worth

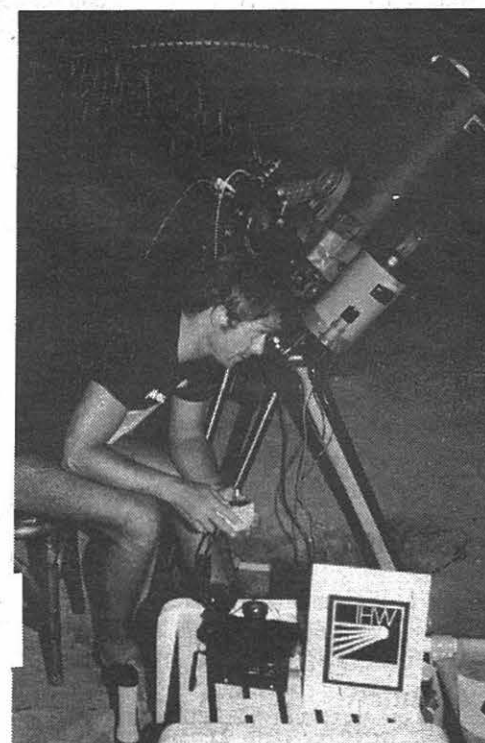


*Halley's Comet photographed with the Schmidt astrocamera from Tahiti on 7 April 1986.*

it when you hear them for yourself. Those computer bit-streams I broadcast on a regular basis might be noise to some listeners but, to people with home computers, they represent an interesting challenge as well as yet another way to combine radio with computers -- and learn some astronomy.

MT: How did you get started in shortwave listening?

**Rosenthal:** I've *always* been into radio. My earliest memories go back to when I was about 5 years old, visiting my grandparents in rural Pennsylvania. They had one of those big old Zenith radios -- you know the ones that stand about 4 and a half feet high? This one had shortwave bands marked with different countries and, just learning to read, I found this fascinating.



*Using an 8" Schmidt astrocamera to make a tracked exposure of Halley's Comet during a trip to Tahiti in 1986. I did this as a member of the "Island Network" for the International Halley Watch, a worldwide organization of amateur and professional astronomers to document and archive scientific data on this visit of Halley's Comet.*

Turning it on, I found I couldn't hear anything. My grandfather -- a decidedly non-radio person -- said that you had to have some kind of aerial but he never tried it. I remember searching the basement for wire to use for an antenna -- I think that was my first radio adventure.

Every visit since that time, I spent hours glued to that radio listening to anything I'd detect. Finally, it stopped working and would only buzz when I turned it on. Later, my grandfather gave it to me and I had it shipped out west; since then, I've rebuilt it from the chassis up and it sits in the family room now.

This may date me but, when transistor radios started becoming affordable, the first one I got had two shortwave bands and I strung up a longwire antenna across the roof for it. When I went to Vietnam, I bought a big Panasonic portable with an even bigger bandspread and strung a special antenna so I could DX from the underground bunker I lived in.

Later, I found myself working as an Electrical Engineer going to Iran on a business trip. Unfortunately, this was just as the Shah's regime was crumbling and I found myself stuck sitting on my little hotel room balcony listening to the occasional urban firefight or watching the helicopter gunships working out a few blocks away. Everything was going along fine and happiness prevailed, according to the local NIRT (National Iranian Radio and Television) service on AM, FM and TV. But listening to shortwave told me I'd better get out ASAP. It's a good thing I listened since the airport was closed the day after I left.

In any case, this brings up something I've always felt strongly about. In the radio-related media, we're always hearing about "our radio hobby." Radio is an *experience*, not a hobby.

Let me express my sincere sympathy if you consider it a hobby since you're obviously missing a big chunk of what's going on. Radio -- especially HF radio -- is one of the only remaining ways you can explore the planet by turning a knob. There's no other way you can cover more ground while sitting in one place. But, better than that, the truly global perspective you develop gives you a view of the world that very few people have. Of course, with 'Skyline,' you're not even limited to the planet.

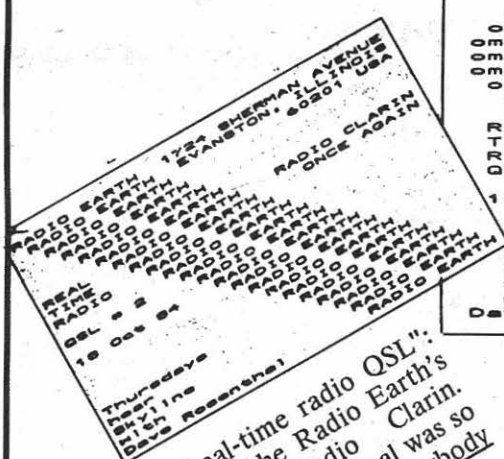


Conducting an interview with Dr. Clyde Tombaugh, discoverer of the planet Pluto.

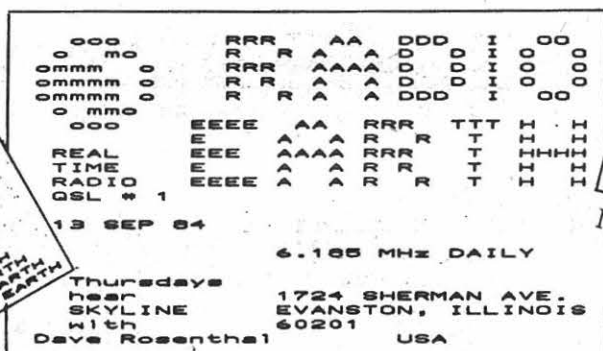


This is the aircraft (UH-1V) I fly the California National Guard. I part of a MEDEVAC unit and have been flying for 18 years now.

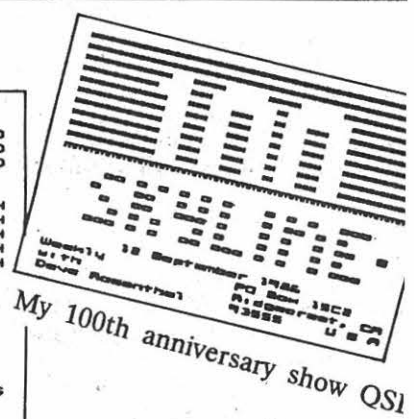
## ROSENTHAL'S QSLs



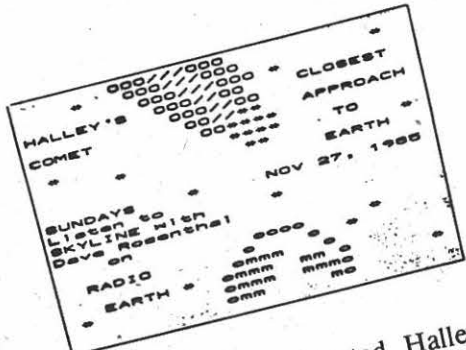
My second "Real-time radio QSL" to commemorate the Radio Earth's move back to Radio Clarin. Unfortunately, Clarin's signal was so poor that I don't think anybody copied this one.



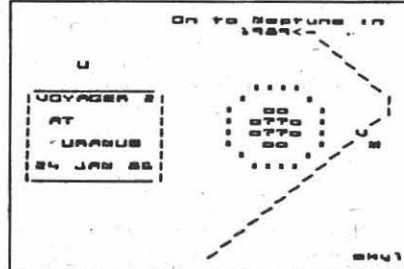
My first "Real-time radio QSL." This was a QSL card sent out over the air as a stream of audio tones. These audio tones are produced by a telephone modem on a home computer. A listener simply makes an off-air recording and then plays it back into a home computer to recover the message. This is a surprisingly effective technique with decent propagation conditions. This particular QSL was perfectly copied throughout North America and as far away as Ghana in western Africa.



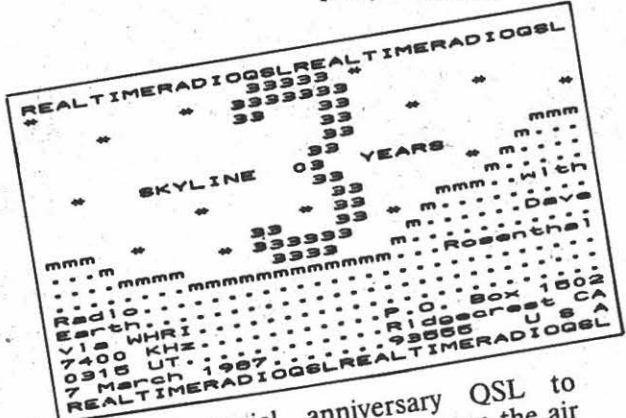
My 100th anniversary show QSL



This QSL commemorated Halley's Comet passing its closest to earth on its way inbound to the sun. Being broadcast via KCBI in Texas, it was widely copied throughout North America.



This QSL was transmitted the night the Voyager 2 Interplanetary probe made its close pass to planet Uranus.



My special anniversary QSL to commemorate three years on the air for 'Skyline'.

# An Introduction to the VHF/UHF Spectrum

## A user's guide for general coverage scanning receivers

by Bob Grove

With the advent of a new technology--continuous coverage VHF/UHF receivers--this is a good time to become familiar with that part of the communications spectrum. Scanner owners have for years known what is in limited portions of that frequency range, but let's take a more perceptive look at 30-960 MHz--without gaps.

### 30-50 MHz

Commonly called "low band", wide area communications are possible because radio waves are more closely related to 2-30 MHz shortwave signals than the higher frequencies and are capable of following the contours of the earth's surface.

The higher the frequency, the more it behaves like light, traveling in straight lines and easily blocked by terrain features.

Utilized both by non-federal-government licensees and federal/military communicators alike, distances of 50-100 miles are commonly heard with skip signals often reported under favorable conditions for hundreds or even thousands of miles.

On frequencies authorized for civilian use, listen for state highway patrols, ambulances, veterinarians, towing services, and other licensees who are likely to travel considerable distances from their base stations.

Federal government users are almost exclusively military, with Army war games and artillery practice, National Guard training exercises and occasional Air Force flights dominating.

Narrowband FM is the dominant communications mode found here with some military field radios operating on wideband FM.

### 50-54 MHz

The amateur six-meter band shares the characteristics of low band, but using single sideband as the primary mode, thus making conventional AM/FM scanners of little use for monitoring this range.

The musical "beep-beep" signals from radio controlled models operated by licensed hams may also be heard here if there is a meet close by.

### 54-72 MHz

VHF-TV channels 2 through 4 are spaced every six megahertz here with sound and picture signals separated by 4.5 megahertz for each channel. Sound is wideband FM, video is AM.

### 72-76 MHz

This short spurt of spectrum is used for low power applications such as wireless microphones, short range telemetry, repeater control links, and radio controlled models. Some voice will be heard on the links in the FM mode.

If you are near an airport you may hear the continuous AM beacon of an outer marker on exactly 75 MHz.

### 76-88 MHz

We return to VHF-TV; channels 5 and 6 are heard in this range with the same signal characteristics as authorized to

channels 2-4 discussed earlier.

### 88-108 MHz

This is the familiar FM broadcast band utilizing wideband voice and music. Some low cost wireless mikes can also be found here, usually where low power educational stations are allocated (88-92 MHz) and so as not to cause interference with stations operating in the next band to follow.

### 108-118 MHz

Utilized by aeronautical radionavigation ground stations (although rare voice communications may be heard by government or military aircraft) to transmit VHF Omni Range (VOR) steering signals to aircraft, AM is used exclusively.

The familiar fluttering sound of the rotating signal beam is interrupted every few seconds by a Morse signal identifying the transmitter. Channel spacing is 100 kilohertz (108.1, 108.2, etc.).

### 118-136 MHz

Still in AM mode, this is the civilian aircraft band, although occasional military and federal government flights will be heard as well. Distances of 100 miles or more are commonly heard for airborne transmissions, while ground transmissions are usually receivable for only a few miles due to their low power and low antenna elevations.

### 136-138 MHz

This is the VHF satellite band used by automatic picture transmitting (APT), low resolution weather satellites in non-geostationary (polar) orbits. Their continuous beacons and characteristic "diddy-dee" facsimile broadcasts may be heard by the simplest of ground stations for several minutes during an overhead pass.

While the mode is FM, it is between narrow and wide bandwidth (roughly 40 kilohertz).

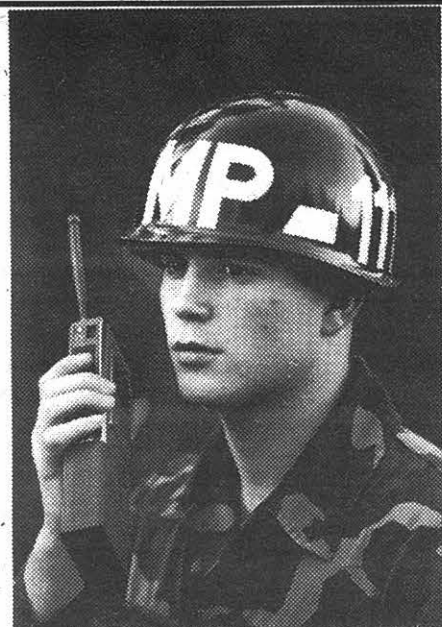
### 138-144 MHz

This is the military VHF aircraft communications band, AM mode. It is in frequent use during training exercises and air shows.

U.S. Navy bases also share this frequency-range for land operations in the narrowband FM mode.

### 144-148 MHz

The famous two-meter amateur band is legend for its repeaters and hand-held transceiver communications nationwide, a busy part of the ham's domain. While some SSB may be



War games and other military operations are frequently overheard on low band.

heard near 144 MHz, the overwhelming mode of transmission is narrowband FM.

### 148-150.8

Back to the military; command post narrowband FM repeaters should be receivable within 20-30 miles of an active base; hand-held transceivers and mobile operations may be heard at shorter distances.

### 150.8-174 MHz

High band, the busiest part of the VHF spectrum. Divided approximately in half, civilian licensees abound below 162 MHz while federal government and military operations are heard above that frequency (one or two small sub-bands are exceptions to the rule).

Public safety, business, FBI, ship to shore, hospitals, military base operations--they're all here and operating in the narrowband FM mode.

### 174-216 MHz

The remaining VHF-TV allocations, channels 7 through 13, are found here with the same signal characteristics associated with the lower channels discussed earlier.

### 216-220 MHz

Inland waterway vessels and shore stations may be heard with navigational control traffic using narrowband FM in major rivers and other waterways of the U.S.



Undercover law enforcement operations provide exciting monitoring for scanner listeners.



Mobile and point-to-point communications permeate VHF and UHF frequencies.



A large number -- probably the majority -- of scanner enthusiasts target law enforcement communications.

#### 220-225 MHz

A hot fight is presently underway to take the first two megahertz away from this amateur band for the land mobile services. This block of ham frequencies is not as busy as two meters, but is commonly in use in all major U.S. cities with both repeaters and simplex communications.

As with two meters, the majority of hams will be heard on narrowband FM.

#### 225-400 MHz

The primary user of this mammoth block of spectrum is the U.S. Department of Defense. Military air traffic abounds, using AM as their voice mode in this UHF aircraft band.



Civilian and military air-to-ground communications can provide exciting monitoring.

A sub-band, 240-270 MHz, is shared with military tactical satellite downlinks, usually in wideband FM mode. Much of this sub-band is populated by encrypted data transmissions, although occasional clear voice is reported.

#### 400-406 MHz

Virtually forgotten by most listeners (for good reason) this minor swath of spectrum is awarded to space telecommand and meteorological monitoring uses. No voice transmissions are likely to be heard and data modes are various.

#### 406-420 MHz

As we enter the UHF land mobile spectrum, we find this range to be occupied exclusively by agencies of the federal government, including military bases. Narrowband FM is the mode, although occasional wideband data transmissions will be heard.

Repeaters and simplex transmissions will both be heard in all areas of the country. In addition to direct base and mobile communications, many inter-city "backbone" repeater links are heard as well.

Monitoring of this range has been a ticklish subject for years since it is home to sensitive undercover operations by virtually all federal law enforcement agencies.

#### 420-450 MHz

This large chunk of spectrum is primarily populated by amateur radio licensees with the regional exception of the first ten megahertz which cannot be used within 100 miles of the Canadian border.

Many modes are employed by the hams for communications here including FM, SSB and fast-scan television.

#### 450-512 MHz

This UHF land mobile band is as busy in the major metropolitan areas as is high band, while in rural areas across the country it is rarely occupied. All communications utilize narrowband FM and all licensees are civilian since the federal agencies have their own UHF band discussed earlier.

#### 512-806 MHz

Why is this band missing from all scanners? Because its only inhabitants are UHF-TV stations! Channel spacing and signal characteristics are the same as for VHF-TV licensees.

#### 806-960 MHz

This most-rapidly-growing part of the radio spectrum represents enormous financial investment to major communications manufacturers and common carriers (radiotelephone companies) on the forefront of high-tech marketing.

Commonly called the "cellular" band, true cellular communications are

conducted only in a limited part of total 806-960 MHz range. All transmissions will be in narrowband FM, with the UHF land mobile band, majority of the communications conducted in major metropolitan areas, and in this band concentrated below 900 MHz.

Hams have been given 902-928 MHz (shared with ISM--industrial, scientific and medical signals); a variety of digital and voice paging as well as communications by both government and civilian licensees are peppered throughout the remaining 32 megahertz, ignored by many current scanning receivers.

So there you have it, a thumb sketch of the VHF and UHF bands. Hopefully this information will fill a void of knowledge among many scanner listeners and will flare interest among monitoring hobbyists previously unfamiliar with this enormous swath of spectrum, over 100 times as large as the entire shortwave frequency range!

## MONITOR



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# SHORTWAVE BAZAAR by Alan Ritchie

**Shortwave... Shortwave... Shortwave...** How many times do we see, think or say that word? Often enough over a period of time that the word loses most of its magic. And magic is what shortwave is all about. The magic of one civilization beaming its signals through the ether; crackling wavelengths alive with energy. Signals from far-away places, pushing, pushing, screaming, to be heard.

Still, the word does get worn out over long periods of time. We get jaded and only rarely does that old chill travel down the spine when we realize anew that what we are hearing is actually a signal from thousands of miles away, traveling at near the speed of light, and coming into our homes through the that little box of components called a radio.

For some, the thrill is conjured up with a dose of Indonesians or the latest schedule from Radio Finland. But for others, it takes some heap big medicine to clear away the cobwebs.

It is a rule of thumb that there is always unusual things taking place on shortwave. Unusual stations. Little-known services. Programs. Oddities. A little from the historical file and perhaps some opinion. In short, these are the kinds of things not

found elsewhere. For you, this may be the magic.

## We Are Having a Little Party Tonight After the Revolution

Emisora Atalaya in Guayaquil, Ecuador, is the key station in a ten station radio network of left-leaning broadcasters whose political stance is at odds with the rightwing government in Quito. According to DXer Carl Huffaker in Mexico City - Atalaya, as the control station of the network - often conducts its own organizational work right on the air, even instigating student demonstrations. The station operates in the vicinity of 4766.6 kHz.

All of the other network affiliates operate on AM only, but when one of them is playing the role of originating station for some local remote broadcast, the originating station's identification announcements run on Atalaya's airwaves. There's a lot of two-way chit-chat between station engineers, usually around 1100 UTC. The Soviet relay in Cuba on 4765 kHz may be the source of interference for those who don't have very selective receivers, but it may be worth the ear strain, especially if you understand Spanish and are able to follow what's going on in this part of the world.

## There's No Place Like Home

Shortwave offers us the chance to tune in on a lot of domestic stations from around the world that we otherwise wouldn't have the opportunity to hear. Unfortunately, most of these aren't in English and that's a downer. But still, there's some enjoyment in just having done it -- having tuned it in because it was there to be tuned in and was something different. Belgium, for example, offers the well-known foreign service of the BRT with its "Brussels Calling" and the lesser known French network, RTBF. But also on shortwave is a third Belgian network -- Belgisches Rundfunkund Fernsehzentrum fur Deutschsprachige Sendungen ("BRF" if you're in a hurry.) -- which is a public service German language network. BRF is aired during RTBF transmissions at 1030 UTC (yes, the *World Radio TV Handbook* says 1130 but the current RTBF schedule says different so who are you going to believe?) Current RTBF frequencies in use at that hour are 7140 and 17675 kHz. It may be that, if you hear this broadcast, you can get BRF's own QSL card. Their address is Herbesthalerstrasse 82, B-4700 Eupen, Belgium.

## Not On Shortwave

There are still, regrettably, far too many places the shortwave broadcast listener can't get to via his radio -- simply because the signals don't exist in this part of the spectrum. Perhaps it's just as well in a way. It's probably good to try something else on occasion, if only to add a little more variety to things. So. Pitcairn Island? Mutiny on the Bounty, Tom Christian and all that?

Some listeners report hearing the Pitcairn point-to-point station, ZBP, in occasional contact with New Zealand. This takes place from around 1900 and continues off and on for several hours using 15520 (or sometimes 18710) and upper sideband. No info on the QSL possibilities, but if you hear this and decide to try, remember not to include any of the two-way content -- only what other station was being worked.

## Looking Back

Speaking of "not on shortwave," about ten years ago people were hearing such goodies as Andorra on 6229... Radio Swan in Honduras on 6015... Enugu, Nigeria on 4900... Emissor Nacional in the Azores on



4865... the Bolivian Emisora Beni on 4990... FR3 in Martinique on 3315. Also Zaire's Radio Lubumbashi on 4750... Radio Norte on 4781 and Radio Commercial, 4881, both from the Dominican Republic.

Radio San Ysidro in Honduras was on 4845... Radio El Mundo (6120) and Radio Splendit (9740) were both still active from Argentina. Radio Impacto's 6150 kHz spot was occupied by Radio Centroamerica in Costa Rica. And there's your dose of nostalgia for July -- even if it wasn't from so very long ago.

## What Is This Thing?

For about a year now -- maybe longer; it's so easy to lose track of time -- there have been periodic appearances on shortwave of a Radio Consentida, a regular broadcaster on 1560 kHz AM in Mexico City. For a while, it was appearing on 6754, then on the 60 meter band, and in the last few months, it's been heard well and widely on 11488 upper sideband. Virtually daily from around 2200 UTC. Mathematically, this doesn't work out to be a harmonic. Checks of the many books available which list utility stations don't show anything from Mexico on these frequencies which might be relaying Radio Consentida as a marker. So is it a case of crossed wires or what?

## Off Track

Radio Melodia in Arequipa, Peru. Ever wonder why they showed up in the 6250 to 6260 kHz area instead of 5995 where they're supposed to be? Seems that the fellow in charge of



Craig Wicks at his diversity reception studio in Michigan

cleaning and maintenance of the station's transmitter accidentally scratched and dislocated the crystal. That's what threw them off frequency. But hold it. There's more. Don't use the station's post office box number anymore. Seems it really belonged to a Chilean woman who has since gone back to Chile so the box has been closed.

### Trying to Stay on Track

Seems the engineers at KSDA had to use a computer just to keep track of the various pieces of the antenna when it was being erected. It arrived in Guam in 40,000 pieces. Talk about "some assembly required."

### Chinese Fortune Cookie?

This station on 8300 kHz pops up on shortwave loggings every few months. The mainland Chinese say it is Taiwanese and the Taiwanese say it is from the mainland. Even the Koreans and Japanese got into the accusing act a few months ago. Anyway, the best information is that the Chinese language identification is "New Star Radio Station Number Four." Broadcasts are given as being at 1500-1518, 1600-1656, and 1700-1730 UTC.

A woman from Taiwan and two men who served in the army of the People's Republic of China say the station is a "spy station" that beams to Taiwan from the mainland but masquerades as a "telegram station" pretending to be on Taiwan. The woman announcer is said to be Taiwanese and the key words in the transmission are "listen carefully." That's fascinating stuff. Want to bet there is not New Star Radio Station Number one, or number two or number three?

### Probessender

It's been going on for a while. It's Deutsche Welle's experimental "Probessender" broadcasts in the compatible SSB mode. Here's the latest schedule: 0600-0955 kHz in German to Europe on 6075; 1000-1155 kHz in German to South America on 17820; 1200 to 1355 UTC in German to Africa on 17845; 1400-1655 in German to Europe on 6040; 1700-1750 UTC in Turkish to the Middle East on 7105; 1800 to 1850 UTC in English to Africa on 7285; 1900 to 2155 UTC in German to the near east, 2200-0100 in German to Central America on 9700 kHz; 0200 to 0355 UTC in German to Europe on 7130 and 0400-0547 in German to Europe on 6100 kHz.

### Also Gone..but Audible

There's a secret place on shortwave where Lydon Johnson still rallies the American public behind the war in Vietnam. Where listeners can hear the final call in a Max Schnell fight or mark the birthday of John Lennon with a snippet of an interview with the late Beatle. Yes, they're all gone, but through the miracle of magnetic tape, the dead do still speak on shortwave.

Tune in Armed Forces Radio and Television (AFRTS) UTC Tuesdays at 0535 by punching up the frequency of 15345 kHz. There you'll hear ABC Audio's "Datebook" feature, a feed for "the exclusive use of AFRTS affiliates." But don't worry. You can listen.

The feature, which commemorates an historic event for each day of the upcoming week, provides stations with little pieces of audio that they can insert into their local newscasts. For you, it's a chance to hear the dead speak.

### What Is This Thing?

For about a year now -- maybe longer; it's so easy to lose track of time -- there have been periodic appearances on shortwave of a Radio Consentida, a regular broadcaster on 1560 kHz AM in Mexico City. For awhile, it was appearing on 6754, then on the 60 meter band, and in the last few months, it's been heard well and widely on 11488 upper sideband. Virtually daily from around 2200 UTC. Mathematically, this doesn't work out to be a harmonic. Checks of the many books available which list utility stations don't show anything from Mexico on these frequencies which might be relaying Radio Consentida as a marker. So is it a case of crossed wires or what?

### CKFX 6080 Ordered Off Air?

CKFX, in Vancouver, British Columbia, which relays the programs of "Super Country" CKWX over shortwave was ordered off the air by Canadian authorities. Arthur J. "Sparks" Holstead, who had just moved his transmitter from Nanaimo, on Vancouver Island, to the mainland, was shocked. He didn't know that he needed a license for his station. A public outcry brought the station back on the air, where it remains today on 1130 AM, 97 FM and 6080 SW.

### He. Talks. Funny.

Radio Cameroon is not bazaar. But the man who reads the news at 0535 UTC on 4850 kHz is. He. Talks. Like. Each. Word. Is. A. Sentence.

### Freebies

Call AT&T at 1-800-874-4000 to request an "International Time Wheel." Hmmmm. That might be handy to a Dxr who might need to know the time in New Caledonia in a hurry. Note that the ad says that you can use the number to "request" the wheel. It doesn't actually say AT&T will send you one, although I guess that is implicit.

Credits: Newsline, Capital Times, Madison Wisconsin (via Jack Sarkason), New York Times, Australian DX News, DX Spread, AWR Recorder, Association of DX Reporters, Richard Lemke, AntiMedia and DX South Florida.

## On the Origin of "CQ"

In past issues we have presented number of interesting speculation on the origin of the word "ham". A letter just received from James V. Dalsem of New Albany, New York suggests an explanation for the origin of "CQ", used for decades by Mors telegraphy operators and hams alike as a general call to anyone listening.

While acknowledged as meaning general call to anyone listening, CQ was apparently first used by Marconi himself who devised a list of Mors shorthand which substantially reduced the amount of transmission time required to send common terms and phrases by a hand key.

Jim suggests that Marconi, an Italian might have derived CQ from the latin "cuique" meaning "whomever". Since many origins of familiar terms are now lost to time, this explanation certainly seems as good as any.

# HUGE

70 PAGE

## SHORTWAVE CATALOG

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**You don't have to be listening to shortwave for too long to remember the name Clayton Howard.** Howard was the host of HCJB's DX Party Line program and a very popular man, indeed. A good portion of that popularity was based on Clayton's personal warmth. Here was an average guy with no formal training as an announcer -- he was in fact a station engineer -- who simply got on the air and did what he enjoyed: talked about shortwave.

Once, twice, maybe three times a week, Clayton and his wife dropped by the house via radio to chat. They had become friends. So when Howard retired a few years ago after literally decades of service to HCJB and its listeners, a lot of folk were quite disappointed. Not that current host John Beck isn't a fine, fine fellow. Sure is. It's just that you're always kind of depressed when a friend leaves. The Howards retired to their home in Florida and somehow, the shortwave bands were just a little lonlier.

The other night, while doing some monitoring for the frequency section at about 2 in the morning, I heard him again. There was Clayton, back behind the mike, once again hosting DX Party Line. It was like seeing old friends again.

While I don't know how long Clayton will be down in Quito, if you haven't had the chance to meet this fine old man of radio, take advantage of this opportunity to tune him in. DX Party Line is heard UTC Tuesdays, Thursdays, and Sundays at 0230 (6205, 9870, 11775 kHz) and 0630 UTC (6205, 9870, 11775 kHz).

**Meanwhile, on a DX program on another channel, MT and a lot of other people got caught in one of Jonathan Marks' wordplays.** We reported last month that editions of the popular "Media Network" DX program were closing with a copyright notice -- something usually done to discourage people from repeating what they heard on the air and which would be kind of a violation of an unspoken rule among the shortwave journalists.

A few days later, Marks called on the telephone. And I immediately asked him, "What's this 'Copyright Radio Netherlands, all right reserved' stuff on your program? Don't you want to be quoted?"

"Ah," said Jonathan, "You weren't listening. It was a *joke*. It said 'All rights preserved.'" Media Network is the same program that taunts its non-profit status with the line, "The program that makes sense -- not dollars." Amazing what a well-placed burst of static can do to intelligibility, sometimes.

**Two well-known shortwave organizations are taking holidays this summer -- the first of which will probably already be over by the time you read this.** Radio Earth (0300 UTC on 7355 kHz over WHRI) left the air during June in order to devote more time to developing its stock offering. The station has been working at building a shortwave transmission facility in Curacao (pronounced "Cure a sow") and is looking for investors. While we don't necessarily endorse or deny the wisdom of such an investment, you can find out how you can own a piece of a shortwave station by writing to Michael Poulos, 1724 Sherman Avenue, Evanston, IL 60201. The station started its vacation immediately after airing its fourth anniversary show.

Also on vacation is the Foundation for International Broadcasting's monthly "World Radio Report." The Board of Directors of that organization voted to spend the summer months organizing the tremendous support proffered to them by *Monitoring Times* readers (see the June, 1987 issue of MT). The next issue will be in the fall, in time for the DX season. If you have any time to donate to the organization, give Board Member Ken MacHarg a call at 502-458-4076.

Meanwhile the firm of Imprime (the French word for printed -- you see it on most airmail envelopes coming in from overseas -- pronounced "ahm pree may") will be carrying on Miller Publishing's traditional Radio Database International pre-publication offer. This year the list price for the 1988 edition of RDI will be \$14.95 plus \$1.95 shipping and handling. But, if you order before August 31, you can get it for \$13.95 plus \$1.95 S&H. (Shipping to Canada is \$2.75 for surface mail; \$3.75 for airmail. Outside of North America, shipping is \$3.50 for surface delivery \$10.00 for airmail. Checks must be in U.S. postal money orders or personal checks drawn on a bank with a U.S. branch.) And, as with Miller Publishing, Imprime will be driving up to Radio Database Headquarters to pick up and ship your copy to you on the same day that it comes off the presses. You can use your Mastercard or Visa and call toll-free, 1-800-323-1776, ext. 126 or send a check or money order for \$15.90 (PA residents add 6% sales tax = .84) to Imprime, P.O. Box 241, Radnor Station, Ranor, PA 19087. Tell them that MT sent you.

**Last month we told you about a hot, new program called "North Country" on Radio Canada International (Monday through Friday 1200-1300 UTC on 9625, 11955, 17820 kHz).** The program, we raved, was "good radio. If more stations offered this kind of fare, there'd be more people tuning in shortwave." So we said.

However, no sooner had the ink dried on the paper than RCI went and changed the program. Now taking about 20 minutes of every show, are repeats of Radio Canada's weekend programming. About halfway into North Country, you'll now hear on Mondays, "Innovation Canada" (new products, etc.); Tuesdays, Shortwave Listener's Digest (long version); Wednesdays, Coast to Coast (current affairs); Thursdays, Spotlight on Science (technology); and Fridays, Shortwave Listener's Digest (short version). While some of these shows are worth hearing and will probably serve an entirely new audience of people who can't hear them on weekends, I can't help but scratch my head and wonder why they had to go in and fix a program that clearly wasn't broken. Still, North Country is worth your time. Give it a listen! If you agree -- or if you disagree -- let host Wojtek Gwiazda know. The only way broadcasters know how they're doing is if you write them. Wojtek's address is P.O. Box 6000, Montreal H3C 3A8.

**Mary Longo of North Palm Beach, Florida writes in with a question.** "I've been trying to find publications about pirate stations (not clandestines). Might you give names and addresses and price for sample issues? If there is a conflict of some sort in doing this, I shall understand."

No conflict at all. MT has no problem recommending other businesses that are reputable and of value to readers. One that clearly is a value is on pirates, called "A\*C\*E," currently under the very capable guidance of Kirk Baxter. Sample copies of "The Ace" which stands for "Association of Clandestine Radio Enthusiasts" -- but which carries a lot of pirate information -- are \$1.00 from P.O. Box 2571, Shawnee Mission, Kansas 66201.

Incidentally, Mary's note reminds me of a story she told me. If memory serves, seems her daughter sent a reception report to a pirate. And a short time later, that pirate showed up at her door, asking for the daughter. Mary found that disconcerting and I guess I would too. Gives you pause for thought -- just who are you giving your address out to when you write for a QSL card.

**Dick Hedlund of Honolulu, Hawaii, checks in to point out reception of the Solomon Islands station on Honaira Guadalcanal on 9545 kHz from 0600 to 0900 UTC.** Reception, says Dick, is good.

In other DX news, you might have noticed the absence of **Radio Tirana from the 40 meter ham bands (7000-7100 kHz)**. This maverick nation previously had transmissions on 7065 and 7090 kHz which are now heard in the 41 meter international broadcast band (7100-7300 kHz) and include 7105, 7120, 7135, 7155, 7165, 7170 and 7205 kHz. Apparently, the station is adhering to a resolution adopted at the ITU World Administrative Radio Conference in February prohibiting broadcasting on the ham bands. Albania's been on the ham bands since the early 60s.

As reported before, **Radio Austria International has a new director**. His name is Paul Lendvai and he's billed as a "right winger," so much so that the left wing Austrian papers rallied against him saying that he would turn the station into an Austrian version of Radio Free Europe. Well, Lendvai's already in place and while no one's saying that the charges have come true, there have been a few changes. The most noticeable is the absence of the English transmission at 0230 UTC on 9550 kHz. It's now in French.

Another English transmission that's apparently disappeared -- though it is so hard to hear no one in these parts will notice -- is the 1400-1430 UTC broadcast from the clandestine Voice of National Salvation. VONS was apparently based in North Korea and favors the re-unification of the two Koreas -- from the North's point of view. Other VONS transmissions include:

0200-0400 on 4557 kHz  
0900-1300 on 4120, 4557 kHz  
1400-1500 on 4120, 4557 kHz  
1900-2130 on 4557 kHz

**Speaking of clandestines, here's one that's a real whopper.** According to the BBC monitoring Service, the listening arm of the grand old lady of shortwave broadcasting, the Cubans have a shortwave station on the air in Angola for the benefit of their troops and workers there. The station, called "Cubanos en Africa" (and once tentatively identified by clandestine expert Gerry Dexter in his book "Clandestine Confidential" as Radio Olanda), has not been reported as heard in at least ten years here, leading many to, frankly, forget about it. But, if you're in for a real DX opportunity, try for it from 0500 to 0600 and again from 1700 to 1800 on 6045 kHz. We'll offer beer for anyone who can get a QSL from this one!

**Good news from Costa Rica this month.** After years of rumors and slow-moving diplomatic exchanges, Spain's President Oscar Arias has reportedly signed an agreement between his nation and this Central American country for the construction of a Spanish Foreign Radio relay transmitter there. If earlier rumors are correct, this might well mean that Costa Rica will get to share in the transmitter time, giving them a forum for some of their own programs -- and hopefully some will be in English. Construction should take the better part of a year.

**Radio Prague has launched a new program called "Czechoslovak Scrapbook" which can be heard Wednesdays at 1900 UTC on 5930 and 7345 kHz.** The new show, which carries elements previously in "Here and There in Czechoslovakia," includes a review of public, cultural and sporting events taking place in this eastern European nation, as well as tourist trips for people interested in visiting Czechoslovakia, Czech recipes, contests, competitions, quizzes, and popular music. Give it a listen and let the people at Radio Prague know what you think -- they contacted us and specifically asked us to ask you for your comments. Their address is Radio Prague, 120 99, Praha 2, Vinohradska 12. I'd also try their evening transmission for the program, although I haven't heard it at that time yet.

While we're on countries starting with the letter, "C," I should tell you that **Radio Havana Cuba has added the frequency 9655 kHz for their evening transmissions.** It's doing pretty well these parts.

**Did you hear Radio Finland during early May?** Apparently, the technical crew went on strike and that was the reason why you heard nothing but recorded music on their broadcasts. The strike is now over and things are back to normal.

**Officials at Radio France International have written in 1 point out that they have purchased additional airtime on Gabon's Africa No. 1 relay transmitter.** It's been heard in French from 0400 to 0600 UTC on 4890 kHz. Meanwhile, tough new economic measures in Gabon have forced a drastic cutback to all locally-originated media in that country -- with the exception of money-making Africa No. 1 on shortwave.

**I keep hearing about a new transmitter for the Voice of Indonesia.** But I've never been able to find it. Supposedly, the new unit is a 250 kilowatt and station officials expect it to improve reception. Unfortunately, no frequency information has been offered to the public and the only time I've caught VOI in recent years was a fluke during my recent trip to the clear, interference-free mountains of Brasstown, North Carolina, at about 0100 UTC. Unfortunately, I can't remember what frequency it was on -- 9680, 11790 or 15150 kHz -- but it was in English. All three frequencies should now bear watching.

**The BBC Monitoring Service reports that Radio Mozambique Nampula has repaired two of its shortwave transmitters.** A 7 kw unit on 4946 kHz from 0800-1500 carries the provincial program and second transmitter -- a flea-powered 250 watt jobber that acts as a point-to-point relay on 7235 (now there's a DX catch for you to try!) is on from 1000-1700 UTC.

**South Africa's popular local station, Radio 5, has been regularly audible -- with a very reasonable signal -- on 4880 kHz past 0400 UTC recently.** Give it a try if you're up.

**Finally, as you may have heard by now, the Soviets have turned off the jammers they've been using against the Voice of America for the past seven years.** To date, only VOA programs in Polish (for Poland) and Dari and Pashto (for Afghanistan) remain jammed. The bad news is that many of those same jammers have now been reportedly turned on Radio Free Europe/Radio Liberty, the U.S. sponsored stations based in Munich, West Germany. At the same time, the Russians have launched a relay of Radio Moscow's North America Service from Cuba on the AM frequency of 1040 kHz -- on an unusual Saturday and every-other Sunday schedule. For now, it's only being heard in southernmost Florida. But keep listening. Stories like these rarely come where you expect them to.

And now on to your loggings.

*Got a subject you'd like to see covered?  
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publication in the listening field.  
Like to write for Monitoring Times?  
Write Larry Miller or Bob Grove outlining your interests  
and your expertise.*

## MONITORING POST: Loggings

Send your loggings to Gayle Van Horn, 160 Lester Drive, Orange Park, Florida 32073 USA. All loggings are of English broadcasts unless otherwise noted.

### 0038 UTC on 9870 kHz

Ecuador: HCJB. International newscast followed by talk show, "Profile," and "Crackerbarrel" comedy show. (Bill Esbrect, Oklahoma City, OK)

### 0040 UTC on 4755 kHz

Brazil: Radio Educacao Rural. Station ID in Portuguese as "Campo Grande." Mostly announcer talk followed by rock music tune, "Eye of the Tiger." Weak but steady signal. (C. Volz, Valparaiso, IN) Very nice catch, Mr. V. --ed.

Venezuela: Ecos del Torbes. Ad for Banco de San Cristobal. time check and ID, singing ads and promotional for upcoming "Musica Latina" program. (Gayle Van Horn, Orange Park, FL)

### 0105 UTC on 4960 kHz

Ecuador: Radio Federacion. Ecuadorian music and slow ballads. Lively sing-along and Spanish-style pop music, all in Spanish. (Carl Montgomery, New York, NY)

### 0225 UTC on 4840 kHz

Venezuela: Radio Velera. Spanish language program of Latin piano music. Local time check at 0230 and popular Spanish vocals. (Carl Montgomery, New York, NY)

### 0240 UTC on 4920 kHz

Ecuador: Radio Quito. National news of Ecuador, Argentina and the U.S., in Spanish. "Radio Quito la Voz de capital" ID, local ad followed by more news on North America. Sounds exotic, but this one is pretty easy to hear. A good DX starting point. --ed.

### 0305 UTC on 4870 kHz

Ecuador: Radio Rio Amazonas. Spanish mandolin ballads. Several public service announcements in Spanish, local time checks and ID. (Gayle Van Horn, Orange Park, FL)

### 0310 UTC on 9940 kHz

Clandestine: La Voz del CID. Almost continuous talk with many mentions of Contras and Nicaragua. Sign off at 0710 UTC. (Carl Volz, Valparaiso, IN)

### 0320 UTC on 4880 kHz

South Africa: Radio 5. 60's rock medley. ID and local time check. Music by Prince and Aretha Franklin. (Martin Killey, Savannah, GA) This has been easily audible through 0400 UTC recently. --ed.

### 0330 UTC on 3381 kHz

Ecuador: Radio Iris. Unusual half-hour IDs and time checks. Local music and Spanish advertisements. (Gayle Van Horn, Orange Park, FL)

### 0332 UTC on 6125 kHz

Germany, West: Radio Free Europe. Russian programming that included several IDs and mentions of USSR. Signal peaked after Libya signed off. (C. Volz, Valparaiso, IN) No jamming? -- ed.

### 0420 UTC on 4820 kHz

Honduras: La Voz Evangelica. Usual Spanish-language religious programming consisting of sermons and music. Lots of QRM, but good signal. (Martin Killey, Savannah, GA)

### 0452 UTC on 6155 kHz

Austria: Radio Austria International. Interesting program about the financial state of Austria as citizens are investing their money abroad. (C. Volz, Valparaiso, IN) Seriously, this is the first time I've ever heard anyone describe an RAI program as "interesting." On a different note, look for changes at this station; they have a new director. Already, the 0230 UTC transmission on 9550 kHz to western North America has reportedly been switched to French. --ed.

### 0710 UTC on 7215 kHz

Cote d'Ivoire: RTV Ivoirienne, Abidjan. Good signal and impressive format, all in French. Local advertisements, time checks, comedy, music and news. Signal faded at 0750 UTC. (C. Volz, Valparaiso, IN)

### 0745 UTC on 11825 kHz

Tahiti: Radio Tahiti. Mostly Polynesian island music but a few announcements in Tahitian. (C. Volz, Valparaiso, IN)

### 0813 UTC on 5025 kHz

Cuba: Radio Rebelde. Spanish pop music plus old favorites by Madonna, the Bangles and Lionel Richie. (C. Volz, Valparaiso, IN)

### 0845 UTC on 4832 kHz

Costa Rica: Radio Reloj. Usual format of upbeat Spanish pop music with "Radio Reloj" ID in Spanish. (C. Volz, Valparaiso, IN)

### 0855 UTC on 5960 kHz

United States: KNLS, Alaska. Station ID as "The New Life Station." Feature program "Family Magazine" that discussed "Dad's responsibilities at home" in English. Music of the 1930s era followed. (C. Volz, Valparaiso, IN)

### 1500 UTC on 6070 kHz

Canada: CFRX. Relay of talk show broadcast over AM station CFRB in Toronto. (Anita McCormick, Huntington, WV)

### 1540 UTC on 17565 kHz

Greece: Voice of Greece. Spanish language transmission including lengthy Greek folk songs followed by station ID and sign off at 1550 UTC.

### 1840 UTC on 11795 kHz

Cuba: Radio Havana. Cuban sports report and program "Cuba Today" featuring the new Martin Luther King Cultural Center in Havana. (Gayle Van Horn, Orange Park, FL)

### 1854 UTC on 15475 kHz

Gabon: Africa No. 1. French talk and commentary with occasional music breaks. Lots of QRM and static. Poor signal. (C. Volz, Valparaiso, IN)

### 1918 UTC on 15084 kHz

Iran: Voice of the Islamic Republic of Iran. Usual news commentary in Farsi with music breaks and recitations. (C. Volz, Valparaiso, IN)

2018 UTC on 6070 kHz  
Canada: CFRX, Toronto. Unusually strong signal. Ads for "Woodbine Center," and "Diamond Store." Music followed ads. (C. Volz, Valparaiso, IN)

2033 UTC on 7115 kHz  
Bulgaria: Radio Sophia. News, headlines, frequency schedule and discussion about Bulgarian foreign policy. (C. Volz, Valparaiso, IN)

2100 UTC on 12085 kHz  
Syria: Radio Damascus. Arabic music with station ID and schedule. Martial national anthem and sign-off at 2205 UTC. Parallel frequency of 9950 kHz.

2113 UTC on 11780 kHz  
Brazil: Radio Nacional Amazonia. ID heard under BBC signal. Rapid fire sports commentary. (C. Volz, Valparaiso, IN)

2140 UTC on 9875 kHz  
Iraq: Radio Baghdad. Station ID with info and kHz. Several selections of Middle Eastern/Arabic music. (Peter Stewart, Miami, FL)

2215 UTC on 9910 kHz  
India: All India Radio. Female announcer in English discussing India's economic cooperation with Swaziland, Zambia and Zimbabwe. "Overseas Service of All India Radio" ID at 2230 UTC. Bad interference from BBC on 9915 kHz and Radio Netherlands. (C. Volz, Valparaiso, IN)

2230 UTC on 5035 kHz  
Central African Republic: RTV Centrafricaine. French-African style music with "ici Bangui" ID and frequency. Native African music followed by interval signal. (Martin Killey, Savannah, GA)

2235 UTC on 15140 kHz  
Chile: Radio Sistema Nacional. Spanish announcer interviewing sports official on the upcoming Pan Am Games in Indiana. ID mentioned "santiago." (C. Volz, Valparaiso, IN) Look for an article on monitoring the Pan Am Games in the August issue of MT. --ed.

2245 UTC on 4850 kHz  
Cameroon: Radio Cameroon Nationale. French pop-rock music, female announcer saying, "Bonsier, Madame, Monsier; ici Radio Cameroon." (Gayle Van Horn, Orange Park, FL)

2245 UTC on 5010 kHz  
Cameroon: Radio Garoua. English ID "This is Radio Garoua" followed by program of native African music in French. Fair signal today. (Gayle Van Horn, Orange Park, FL)

2250 UTC on 4915 kHz  
Ghana: GBC. International news headlines in English, and "GBC Ghana" ID. Religious choral music and prayer in vernacular followed. (Y. Lee Kiotee, Yuma, AZ)

2300 UTC on 4990 kHz  
Nigeria: Radio Nigeria. English news of Nigeria with ID and frequency information. Male announcer with "It's midnight in Lagos, good night everyone." National anthem and sign off at 2305 UTC. (Kenneth Clarke, FPO NY)

2304 UTC on 9695 kHz  
Sweden: Radio Sweden International. Discussion on China's open door

trade policy with Sweden. Parallel frequency of 11700 kHz.

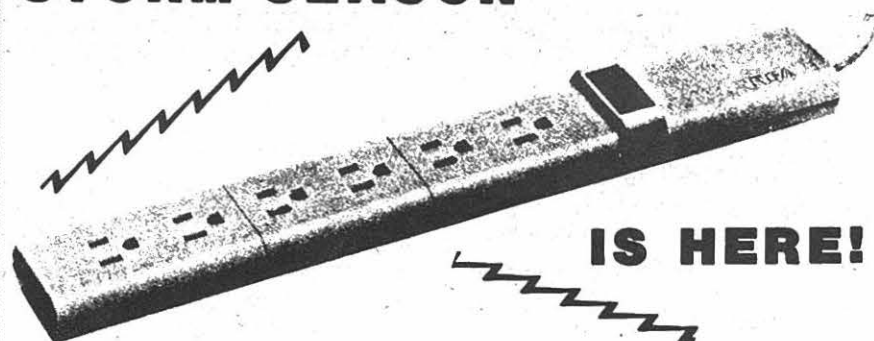
2310 UTC on 4900 kHz  
Guinea: RTV Guineene. Native African instrumentals, interval sig and ID at 2330 UTC. Music announcements followed by a Simon a Garfunkle song. Closing ID, national anthem and sign-off at 0000 UT All announcements in French. (Peter Stewart, Miami, FL)

2325 UTC on 9645 kHz  
Brazil: Radio Bandeirantes, Sao Paulo. Happy-sounding, singi Portuguese language IDs, local commercials and time check. Ea listening Portuguese music. (Gayle Van Horn, Orange Park, FL)

2335 UTC on 4815 kHz  
Burkina Faso: RTV Burkina. French-speaking male-female announ combo with lots of chit chat and laughter. Seemed to be a phone-in t show format although I always wonder how many people in a coun like BF have phones to participate. Brief radio drama followed interval signal and ID. Closing national anthem and sign off. (Mar Killey, Savannah, GA)

2335 UTC on 4940 kHz  
Cote d' Ivoire: RTV Ivoirienne, Abidjan. French pop vocals and nat African music with brief announcements in French between selectio Native drum instrumental followed by ID, the national anthem and si off at 0002 UTC.

## STORM SEASON



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## RADAR TIPS ITS HAND

Just as police radar guns can be detected by motorists' "fuzzbusters" well before the transmitters can record the speed of the upcoming vehicles, military aircraft and naval radars can be easily heard for thousands of miles in advance of an approaching attack or convoy.

An enemy can easily profile an upcoming wave of offensive targets. Each member will emit its own characteristic "signature" radar signal, and at a different frequency from the others to avoid interference, thus providing the opportunity for the enemy to count the individual signals.

A recent article written by Thomas S. Amlie, former technical director of the Naval Weapons Center at China Lake, California, provided some frightening insight into the vulnerability of the mainstays of our defense.

According to Amlie, because of early detection and subsequent destruction by anti-radiation missiles (ARMs), immediate American casualties would include the B1 bomber, F14, F15, F16, F18, F111, A6, AWACS, Patriot air defense system, and any ship operating a radar (especially the new Aegis billion-dollar guided missile cruiser).

(Item contributed by Robert H. Eisner, Wheaton, MD)

The U. S. Air Force "dooms-day" network will continue to grow according to a conclusion published by that service in Washington recently. In an inch-thick draft of their environmental impact statement, the Air Force maintained that Project GWEN (Ground Wave Emergency Network) would have little or no effect on the environment if installations sites were appropriately chosen.

The grid of low-power (2500 watt) transmitter and receiver relay towers is being installed at locations across the United States to serve as a survivable low frequency network following a nuclear attack. They are EMP (electromagnetic pulse) hardened to withstand the devastating electronic disruption of a high altitude nuclear burst.

At a cost of over \$1 million each, the Air Force is building a "thin line" system of 56 "pods" (relay towers)

and 38 control terminals at military bases across the country. Many citizens groups have sprouted up opposing the installations as nuclear targets, but the Air Force says that their remote locations would not be attractive to such aggression.

(Sent in by J. Ingram, Havelock, NC)

Did you know that you can **hear WWV via earth satellite?** While the data transmission won't do you much good, the signals from WWVS can be heard emanating from GOES (Geostationary Operational Environmental Satellite) on 468.825 MHz (135 degrees W. satellite) and 468.8375 MHz (75 degrees W. satellite).

The time signals are uplinked to the birds from Wallops Island, Virginia, and are heard delayed by about 0.26 seconds; thus, the signal is advanced by that amount before ground transmission.

Additional information is available from Time and Frequency Division, national Bureau of Standards, Boulder, CO 80303; ask for NBS Special Publication 432.

(From Ham Radio magazine)

For dependable and high antennas, **it's hard to beat a blimp!** The U.S. Navy has plans to deploy the gas-filled radar observation platforms to detect cruise missiles up to 200 miles over the horizon.

Under the auspices of the Naval Airship Study Program (NASP) commandeered by Westinghouse and Good year, a decision will be made as to whether to utilize the AN/APS-138 radar presently flown by AWACS aircraft or the AN-TPS-63 radar now deployed in tethered balloons monitored by the U.S. Customs Service to detect drug smugglers in the Caribbean.

Huge rewards are at stake; up to \$200 million for the first contract prototype and as many as 50 additional blimps at \$60-60 million each at a later date.

(From Microwaves and RF)

A **new radio telescope** is undergoing construction near the site of the present Very Large Array (VLA) at Socorro, New Mexico, on the Plains of San Augustin. Comprising a phased array of 27 25-meter dishes on a Y-shaped grid of railroad tracks, the present antenna system will yield to a much larger Very Long Baseline Array (VLBA) at a cost of \$75 million.

Frequencies for observation will include 91 cm (330 MHz), 49 cm (610 MHz), 20 cm (1.5 GHz), 13 cm (2.3 GHz), 6 cm (5 GHz), 3.5 cm (8.5 GHz), 2 cm (15 GHz), 1.3 cm (23 GHz), and 7 mm (43 GHz). A tenth band, 3.5 mm (86 GHz) may be added later for tighter resolution of distant signals, down to 0.1 milliarc-seconds.

Feeds for the two lowest frequencies (91 and 49 cm) are at the prime focus, while higher frequencies will use Cassegrain focus. Low-noise amplifiers (LNAs) employ GaAs FETs for 2 and 91 cm, high-electron-mobility transistors (HEMTs) for 1.3 cm, and superconductor-insulator-superconductor (STS) mixers for 7 mm.

For lowest noise, some LNAs will be cooled to 15 K (-258 degrees C) by a closed-cycle liquid helium refrigerator.

(From Microwaves and RF)

In Columbia, Missouri, a **suspected prairie chicken poacher turned out to be a Bearcat scanner!** More than a few faces were red following this misadventure.

Graduate student Dave Jones was flying over a research area designated by the Department of Conservation tracking signals from radio-tagged prairie chickens when suddenly he heard a signal coming far from the range.

Suspecting that a poacher had failed to remove a transmitter from his illegally-bagged quarry, a conservation agent was alerted and a ground search begun. The signal was detected coming from the house of a deputy sheriff who was also the town's mayor!

A very flustered elderly lady answered the door and let the investigators in. The radio-direction-finding (RDF) antenna led straight to a back room--and to a Bearcat scanner! Apparently the oscillator was emitting enough radiation on the conservation department's radio tag frequency to be heard for a considerable distance.

The embarrassed officials apologized for the inconvenience and went back to revise some instructions in their conservation course!

(From Jeff Kunce, Engineering Computer Specialist, MO Dept of Conservation)

At Sugar Grove, West Virginia, the **top-secret NSA spy in-**

**stallation** continues to evade inspection from the outside even after some 30 years.

Operated by the Naval Security Group for the National Security Agency, the massive installation is atop Bother Ridge, 30 miles west of Harrisonburg, VA, and sprouts an impressive array of antennas including one giant 150-foot-diameter dish.

Staffed by 150 military personnel, 32 civil servants and 19 civilian contractors, the remote listening post monitors satellite downlinks of international telephone calls and other radio traffic intercepted by NSA monitoring posts around the globe, according to knowledgeable sources.

Another listening target is ostensibly the Communications Satellite Corporation earth station located at Etam, less than 70 air miles away. Most long distance telephone calls in the United States are handled by such facilities, prime targets for such surveillance.

The received signals are fed via hard line or microwave to NSA headquarters at Ft. Meade, Maryland, where they are analyzed with Cray 2 computers, the most powerful in the world, according to intelligence specialists.

(Clipping from Wayne Hess, White Stone, VA)

Although the Electronic Communications Privacy Act of 1986 (ECPA '86) is now in effect, a recent **scanner labelling Petition for Rulemaking** filed with the FCC by Regency Electronics has fanned the flames in Washington once again.

We reprint the following excellent synopsis of the latest debacle on Capitol Hill as presented in the June 1, 1987, issue of Fred Maia's W5YI Report:

### FROM DC TO DAYLIGHT -

If it travels by a wave, whether short or long, **MT** is interested and so are our readers! We welcome contributions of newspaper clippings, column and project ideas, your experiences. **MT** wants to be **YOUR** paper!

# W5YI REPORT.....

Page #9

June 1, 1987

## COMMENTS FILED ON SCANNER LABELLING

In our last issue we reported on RM-5836, the Petition for Rulemaking filed by Regency Electronics suggesting that warning labels be attached to scanning receivers as an acceptable method of alerting the consumer that the Electronic Communications Privacy Act (ECPA) prohibits receipt of many protected radio frequencies. Comments are now being received at the Commission.

GTE Service Corporation, McCaw Communications Co., Scanner Association of North America (SCAN), headed up by Robert A. Hanson, W9AIF, Telecator Network of North America, Southwestern Bell Mobile Systems, Tandy Corporation, the Cellular Telecommunications Industry Association (CTIA) and others have all filed comments.

With the exception of the SCAN, all commenters have extensive cellular telephone interests and have lined up solidly against the Regency labelling petition. Most comments failed to address the fact that the Privacy Act applies to thousands of frequencies from the lower HF band upwards. It appears that nearly all commenters are concerning themselves only with cellular conversations.

Regency's proposal was not just for scanners that can receive 800-MHz spectrum but for all scanners because the Privacy Act does not just apply to cellular - it applies to frequencies all across the radio spectrum.

CTIA, the largest cellular industry trade organization, believes that all scanners capable of receiving the 800-MHz "cellular band" are now illegal and that every time they are assembled, used, advertised, sold, manufactured, transported or possessed by anyone is each a separate violation of the Privacy Act and there are now thousands and thousands of violations.

CTIA is not interested in labels - but in getting any scanner capable of picking up cellular phone conversations off of the market. "There is no technical necessity for a scanner to monitor all frequency bands..." CTIA's position is if the FCC required a label to be affixed to a scanner, this would imply

that the government is actually approving the manufacture and marketing of those scanners.

"These scanners pose a problem to the cellular industry and a threat to cellular subscribers. They may ultimately impair the ability of the cellular industry to compete effectively with other technologies. ...Regency should not pass through its obligations under the privacy laws to its customers simply by labelling its cellular scanners."

Southwestern Bell Mobile Systems said "Regency seems to be seeking to shift responsibility for compliance with the new law entirely to individual consumers who are ill suited to comprehend and apply all of its intricacies. If given free rein, Regency would simply label the equipment and wash its hands of any improper uses... If the burden of preventing the misuse of scanning devices is to be placed on anyone, it should be borne by the small group of manufacturers that are capable of effectively disarming the devices of their prohibited use. ...The consumer is not protected by the label except that he/she is either (1.) discouraged from using the device improperly after he/she determines what exactly is prohibited or (2.) indirectly encouraged to be secretive about the improper use and thus to evade the law."

Tandy Corporation (Radio Shack) said they do not manufacture, distribute nor retail 800 MHz scanners. While page 89 of their catalog shows the PRO-2004 750-1300 MHz, scanner, the cellular frequencies are locked out by use of a well publicized diode which can be removed. "Scanners that are not capable of intercepting cellular telephone communications cannot be expected to be used to any significant degree, if at all, to intercept communications in violation of the Privacy Act. The imposition of a labelling requirement on these units would unfairly burden the manufacturers of those scanners."

It is important for radio amateurs that the so-called "cellular band" be well defined. Some people define the band as extending from 800-960 MHz - right across the 902-928 MHz ham band. Telecator Network of America said there is no legitimate purpose for scanners. "Regency's proposal assumes that a

sophisticated and multi-faceted statute like the Privacy Act can be adequately condensed into a single phrase warning." While Regency warns that cellular reception is bad, Telecator contends that all uses of scanners are bad ...there are no proper uses of scanners.

The Scanner Association of North America (SCAN) approves of the label as 'a positive educational tool'. "Without arguing the merits of the Privacy Act it is clear, even to the casual observer, that much of the communications intended to be protected by the Act is readily available accessible by rudimentary means. A tunable UHF-TV converter or TV set with a continuously variable tuner can be easily used to receive cellular phone transmissions."

SCAN also said that warning labels should be on cellular telephone hardware. "It is our contention that the public has the perception that cellular phones are as private as a wireline phone call. This is a perception that needs to be quickly corrected."

McCaw Communications, a very large cellular organization... "The proposed label requirement is unnecessary and will have very little public interest benefit. A government mandated label could actually serve to shield the manufacturer of certain scanning devices from potential criminal liability by appearing to give implicit FCC authorization for the manufacture and sale of these devices." McCaw obviously has not read the Privacy Act which does not prohibit the manufacture of any type of receiver.

It appears that firms that have an interest in the cellular telephone business simply want scanners eliminated that can tune the 800 MHz band. From the way we read the Privacy Act, Regency is entirely within its rights to manufacture any scanner, with or without a label, to tune any band.

For information on subscribing to W5YI, write to W5YI, P.O. Box 10101, Dallas, TX 75207.

## CORRECTION: ENVIRONMENT CANADA PUBLICATIONS

A tip sent in to MT a few months back has resulted in a number of inquiries to the Atmospheric Environment Service of Environment Canada. Unfortunately, the well meaning tip proved to be incorrect and the department has been busily sending out disclaimers to MT readers requesting additional information. We quote their letter below.

"The article in Monitoring Times was in error. The only RTTY weather broadcasts we have originate at CFH Halifax. The brochure "Making the Most of Environment Canada's Weather Forecasts" simply describes the public forecast regions used in Ontario.

"There are two stations [of our Weatheradio system] currently in Ontario

(Toronto and Ottawa) with a third (Collinwood) due to start operating this summer. Weatheradio is also operated in all other provinces and throughout the United States."

(Signed) N. B. Cutler, A/Regional Director  
AES, Ontario Region

*The system in use is not an RTTY network, but simply an extension of the well-established VHF/FM voice weather broadcasts already familiar to scanner listeners.*

*MT regrets the imposition on Environment Canada caused by our erroneous report and appreciates that department's time-consuming effort to answer our readers' numerous inquiries.*

# MONITORING POST: Loggings

## Scanning Profile

Tucson, Arizona  
Contributed by James Simms

### Key to Abbreviations:

AMB Ambulance  
ANG Air National Guard  
CAP Civil Air Patrol  
F Fire  
L Local government  
LP Low power (car-car) and hand-helds, no repeater  
M/A Mutual aid freq  
MARS Military Affiliated Radio System  
MED Medical  
MP Mobile phone  
PC Pima County  
S Security  
S&R Search and rescue  
S&W South and west  
S.W Southwest  
SEW Sewer system  
SO Sheriffs office  
SW Statewide  
TUC Tucson  
USA US Army  
USAF US Air Force  
WX Weather

Frequency	Ch	Agency	Location	Frequency	Ch	Agency	Location
037.9		A&A AMB	TUC	159.09		MARICOPA S&R PHX	
0049.98		USAF MARS	PHX?	162.400		NATIONAL WX MT. LEMMON	
143.450		USAF MARS	MT. LEMMON	154.400		F	NOGALIS
164.700		ANG CRASH	TUC	154.34		F	ORICAL
166.225		ANG MED NET	TUC	147.30		PC RACES	TUC
143.99		USA MARS	MT. LEMMON	155.220		PC S&R	TUC
463.400		ASSOC. AMB.	TUC	047.46		PC S&R	TUC
468.175		AZ POISN/DRG	TUC	155.16		PC S&R SW	SW
148.150		USAF CAP	MT. LEMMON	155.955	M/A	PCSO MUT. AID	US WIDE
453.55		F	CORONA DE TUC	155.475	M/A	PCSO MUT. AID	US WIDE
173.575		USAF CRASH	TUC	154.400		F R/METRO	TUC
173.4875		USAF HOSP	TUC	153.89		F R/METRO	TUC
453.150		F	DREXEL HTS	154.375		F R/METRO	TUC
170.200		FED DSTR NET	NATIONAL	047.42		RED CROSS	US WIDE
154.34		F	FLOWING WELLS	154.22		F	S TUC
154.34		F	FRY	154.25		F	SIERRA VISTA
154.175		F	GOLDER RANCH	155.265		ST. MARY HSP	TUC
154.370		F	GREEN VALLEY	154.43		F/SUBURBAN	NOGALAS
463.000	1	HOS/AMB	SW	453.750		F	TUC
463.025	2	HOS/AMB	SW	453.800		F	TUC
463.050	3	HOS/AMB	SW	453.325		F	TUC
463.075	4	HOS/AMB	SW	453.300		F	TUC
463.100	5	HOS/AMB	SW	453.25		F	TUC
463.125	6	HOS/AMB	SW	453.100	F-01	F	TUC
463.150	7	HOS/AMB	SW	453.200	F-02	F	TUC
463.175	8	HOS/AMB	SW	453.600	F-03	F	TUC
453.850		KINO HOSP PG	TUC	453.400	F-04	F	TUC
462.950		KORDS AMB	TUC	154.130	M/A	F	TUC
462.975		KORDS AMB	TUC	154.19	M/A	F	TUC
155.175		KORDS AMB	TUC	154.28	M/A	F	TUC
153.83		LP F	US WIDE	480.575	F-08	F/DISPATCH	TUC
150.775		LP MED	US WIDE	154.160		F	TUBAC
150.79		LP MED	US WIDE	155.400		S/ U OF AZ	TUC
173.5875		LUKE CRASH	PHX	155.76		L/ U OF AZ	TUC
				040.50		USA S&R	US WIDE

## UNUSUAL CATCHES

Andrew Gordon of West Hartford, Connecticut, called MT headquarters the other day to report two interesting shortwave utilities catches. Tactical communications bursts of words like "shots", "salvos", "spotters", and "casualties" prompted his concerted listening on 2713 kHz upper sideband.

We tuned up on the same frequency to hear the communications which lasted on into the night. Apparently, Andrew had stumbled onto war games being played by the U.S. Army on the east coast.

His second catch was quite a contrast. On 14477 kHz upper sideband, U.S. Navy MARS (Military Affiliate Radio System) shipboard station NNN0CVQ (USS Voge) was passing personal traffic from enlisted men back to the states.

Deliberately interfering on the same frequency were shouts from Latin American bootleg stations (most likely drug runners) repeating, "F--- Y---, Yankee!" Shortwave DXing can be interesting, indeed!

Ottawa, Ontario, Scanning  
Contributed by Anthony Trollope  
London, Ontario

### Frequency Agency

138.9450	RCMP (Royal Canadian
139.0800	RCMP Mounted Police)
139.1400	RCMP
139.1850	RCMP
139.3200	RCMP
139.4100	RCMP
139.5000	RCMP
139.5300	RCMP
139.5600	RCMP
139.5900	RCMP
142.0950	PD
142.2300	PD C.A.D.R.E.
142.2450	PD
142.4850	PD
142.7250	PD
142.9950	PD
143.8950	BANK OF CANADA
148.6700	MIN OF TRANSPORT
154.0700	FD
154.1750	FD XJG67
154.3700	FD
410.0375	WORKS DEPT
410.1275	OTTAWA TRANSIT
410.1275	OTTAWA TRANSIT
410.1875	RCMP
410.3125	RCMP
410.4125	RCMP
410.5875	HOUSE OF COMMONS
411.0625	HOUSE OF COMMONS
411.0875	HOUSE OF COMMONS

411.1250	OTTAWA TRANSIT
411.1875	HOUSE OF COMMONS
411.6250	OTTAWA TRANSIT

U.S. National Park Freqs  
for North and South Carolina

Contributed by Bill Britt  
Whiteville, NC

### NORTH CAROLINA

Blue Ridge Parkway
166.375
167.175
411.7
417.475

Blue Ridge TIS  
530 kHz Mt. Pisgah  
1610 kHz Mabry Mill

Cape Hatteras
164.2
164.725
169.15
169.65

Cape Hattera TIS  
1610 kHz Bodie Island  
Buxton  
Ocracoke

Great Smoky Mtns. TIS  
530 kHz Deep Creek  
1610 kHz Cataloochee  
Clingman's Dome  
Oconaluftee  
Smoke Mtn.

Guilford Court House  
164.425

Kings Mtn.  
171.775  
172.475

### SOUTH CAROLINA

Congaree
461.5 (Columbia)
466.5 (Columbia)
166.85 (Columbia)
169.775 (Gadsden)

Cowpens  
171.775  
172.475

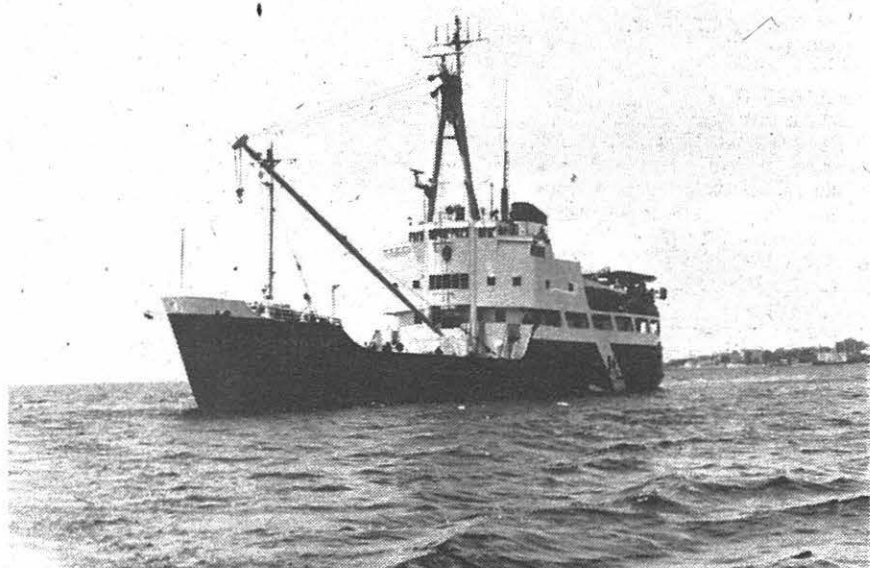
Ft. Sumter  
169.4  
170.05  
171.775  
172.475

Ft. Sumter  
169.4  
170.05



**James R. Hay**  
141 St. John's Blvd.  
Pointe Claire, P.Q.  
Canada, H9S 4Z2

## THE CANADIAN COAST GUARD



*CCGS Alexander Henry off Main Duck Island in Lake Ontario is typical of the ships used for tending navigation aids in the summer and icebreaking in the winter.*

While this column is devoted to giving the frequencies used by various stations in the maritime, little information is provided to show what the stations themselves do. This month we will take a look at the radio stations of the Canadian Coast Guard who, unlike their American counterparts, perform a much wider service.

While the United States Coast Guard equips its stations with radio for both operations and safety, the Canadians have gone a step further by assuming the role of public coast station, providing ship-to-shore telephone service as well.

Coast Guard radio stations use a system of remote control transmitting and receiving sites to increase their coverage area and to fill in dead areas. As an example, Montreal Coast Guard Radio (VFN) covers approximately 125 miles along the St. Lawrence River and approximately 60 miles up the Ottawa River.

This wide coverage is achieved by supplementing the main transmit/receive site at Mont St. Bruno with peripheral stations located at Rigaud, Sorel and Trois Rivières, P.Q.

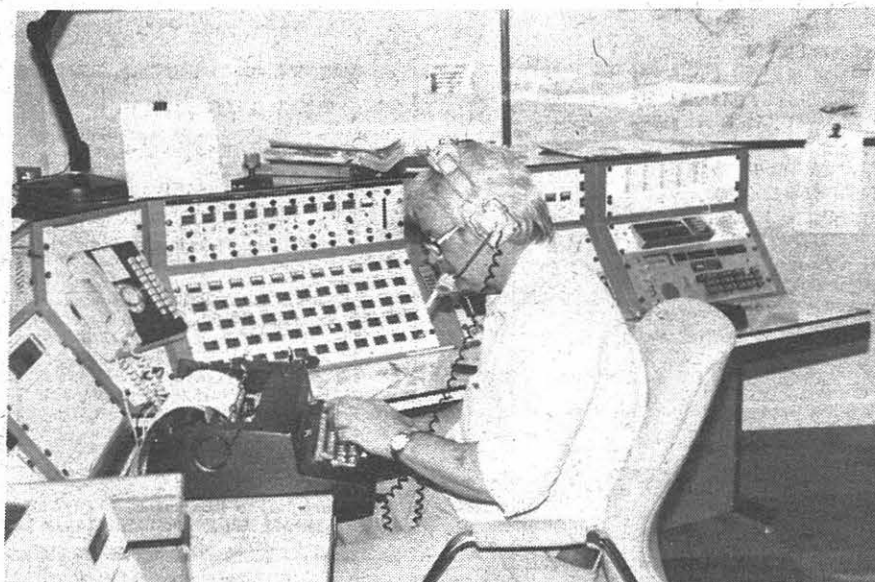
The stations are all equipped with 156.800 MHz (Ch.16) as well as other Coast Guard and public correspondence frequencies. The frequencies chosen for use at each peripheral station are chosen so as not to cause interference with adjacent stations.

The stations provide service 24 hours a day all year round except in some areas where the navigation season is shortened due to ice conditions in the winter. One, two or three operators may be on duty depending on how busy the station is and some of the stations on the coasts—notably

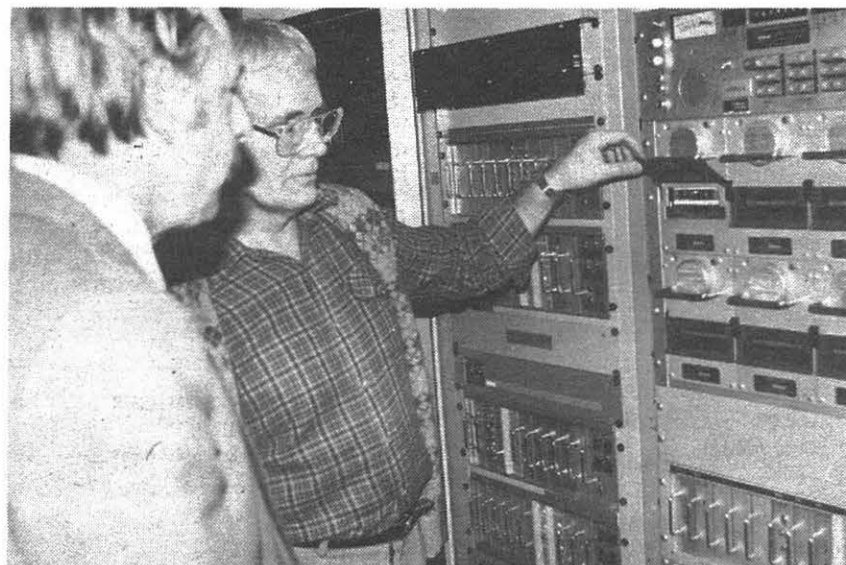
Vancouver and Halifax—have many more due to their high volume operations.

At any station during the operating season there is always one operator on duty and the primary position can operate all of the facilities of the station. If the station is equipped for telegraphy, then the first position will be equipped with a key regardless of whether or not other operating positions are so equipped.

The stations are equipped for direct communications with Coast Guard stations and the regional Rescue Coordination Center to provide search and rescue communications, as well as regular Bell Telephone equipment for providing telephone communications for ships. Leased lines from Bell Telephone also act as links between the station and its peripheral transmitting/receiving sites.



*The Montreal Coast Guard radio operating room has three operating positions from which any remote transmitter or receiver can be controlled.*



*Emile Bonneau of the Montreal Coast Guard radio station demonstrates to Stu Smith the remote control equipment for the various peripheral sites as well as the log tape recorder and a special six-bay cassette machine used for continuous marine broadcasts.*

In addition to internal and public telephone lines, the stations are also equipped with telex terminals for handling meteorological reports, routine messages relating to Coast Guard operations and traffic from commercial ships.

At the operating consoles, an operator is usually able to use any frequency available at a peripheral site. All receivers are monitored via a scanning system which automatically samples each frequency and will pass on any signals which it finds incoming.

In order to eliminate the chance of missing a call on channel 16 which is the international distress and calling frequency, a permanent connection is maintained for that frequency so that all calls are heard at the station.

Among the services provided by the Canadian Coast Guard is a continuous marine broadcast on VHF frequencies 161.650, 161.775 and 161.850 MHz, depending upon the location. This broadcast relays weather information, notices to shipping and other information 24 hours a day.

The Canadian Coast Guard makes extensive use of remote control equipment; all transmitting and receiving equipment is duplicated to minimize lost time due to failures.

Telephone lines are not duplicated; however, a separate line is used for channel 16 and one or more lines may be used for working channels depending upon the age of the station equipment and how much traffic it handles.

### TRAFFIC HANDLING

Toronto Coast Guard Radio (VBG) handled almost 7000 messages in July 1982, while Cardinal Coast Guard Radio (VDQ) handled approximately 8000 in all of 1981. Toronto's coverage area includes western Lake Ontario, eastern Lake Erie and Lake Simcoe—a favorite area for summer recreation for Toronto residents. But Cardinal covers only eastern Lake Ontario and the St. Lawrence River from about 15 miles east of Cornwall westward and is, therefore, much quieter.

The Canadian Coast Guard radio stations' marine operator service allows some recovery of operating costs and also gives the operators some familiarity with those users regularly in the area. Generally speaking, the operators prefer the Canadian system to the American in that there is more work being done and they feel that an excellent safety service is still provided.

**Bob Grove, WA4PYQ**

P.O. Box 98  
Brasstown, NC 28902

## TUNING IN ON THE U.S. NAVY

The United States Navy is the world's largest user of radio communications. A casual spin of the shortwave dial is likely to reveal communications in every imaginable mode--upper sideband voice, radio-teletype, Morse code, facsimile, clear and encrypted data.

Utilizing point-to-point, aeronautical mobile, land mobile, portable, and satellite links across the globe, the Navy is an imposing presence on the radio spectrum.

During emergencies in the Middle East, tactical communications swell

the assigned frequencies. Routine civil contingencies like range fires have brought up satellites for crucial communications. Drug interdiction on the high seas is often assisted by U.S. Naval attachments utilizing Navy frequencies.

This month MT takes a look at the frequencies and identification of the most commonly encountered U.S. Navy shortwave radio activity. We invite corrections and additions to these listings from our readers in order to update the next edition of the popular *Shortwave Frequency Directory*.

### U.S. NAVY TACTICAL CALL SIGN IDENTIFIERS

Although U.S. Navy callsigns are gradually being phased out in favor of 3-digit identifiers ("Lima Five November"), many of the old callsigns are still in use. The more common of these are listed below.

CALL SIGN	LOCATION	CALL SIGN	LOCATION
ANGEL	EH -46 Marines rescue helicopter	HERSHEY	CINCLANT/Joint Air Reconnaissance Centre, Key West
BARBARIC	US Navy facility, Guantanamo Bay, Cuba	JITTERBUG	NAVCOMSTA Balboa, Canal Zone
BATTER UP	Any NAVCOMSTA this frequency	MUSTANG	USS Coral Sea
CLIMAX	USS Enterprise, CVAN-65	OVERWORK	Naval network general callsign
COMSERON	USCG Key West, Florida	PANTHER	USS Kitty Hawk
COURAGE	USS America	PLEAD CONTROL	Pacific Missile Firing Range
EAGLE CLIFF	USS John F. Kennedy	RASPBERRY	Naval air stations prefix
FAIRFIELD	USS Saratoga	RAWHIDE BASE	Squadron VRC-40, Norfolk, Va.
FISHER BODY	ATC Guantanamo Bay NAS, Cuba	SCHOOL BOY	USS Midway
GOLD EAGLE	USS Carl Vinson	SPARTAN	USS Lexington CVT-16
GRAY EAGLE	USS Ranger	STONEWALL	CINCPAC
HAMPSHIRE	Commander Naval Forces Caribbean, Roosevelt Rds NAS, PR	STRONGBOX	Naval network call designator
HANDBOOK	USS Forrestal	SWORDFISH	USCG Aircraft 01
		TORREADOR	NAVCOMSTA San Francisco, Cal.
		YELLOW BLOOD	HQ Fleet Marine Force, Pacific

### U.S. NAVY CONVOY VOICE CALL SIGNS

Convoy internal call signs are used only between ships within a convoy, the escort force and supporting aircraft on short range communications channels. They are never used when communicating with shore stations or for contacting other forces.

#### SHIPS OR AUTHORITIES

Commodore  
Vice Commodore  
Convoy Collective  
Commodore's section  
Vice Commodore's section  
Rear Commodore  
Rear Commodore's section  
Escort force commander  
Individual ships in convoy  
Escort ships, collective  
Escort ships, individual  
Patrol/support group commander  
Patrol/support group collective  
Escort carrier No. 1  
Escort carrier No. 2  
Escort carrier No. 3  
Escort carrier No. 4  
Rescue ships  
HF DF ships  
MF DF ships  
Ships operating aircraft  
Ships in or near the van  
Ships in or near the center  
Ships in or near the rear  
AA cruiser(s)  
Ship controlling aircraft  
Even numbered ships  
Odd numbered ships  
Leading ships of columns  
Leading ships on the port side  
Leading ships on the starboard side  
Rear ships on the port side  
Rear ships of columns  
Rear ships on the starboard side  
Even numbered columns  
Odd numbered columns  
Columns on the port side  
Columns on the starboard side  
Screen commander  
Escorting aircraft

#### CALL SIGN

CHIEF  
LUCK  
TEAM  
VAMP  
MERGE  
CASEMATE  
SWAP  
BOSS  
DELTA + position no.  
GANG  
BIT + hull no.  
FOREMAN  
MOB  
NEST  
COTE  
STARCAST  
SACK  
STRETCHERS  
DUFFER  
METER  
HAWKER  
VAN  
MID  
REAR  
CRACKER  
EAGLE  
ROMP  
TAX  
CANDY  
BRIDEWELL  
PAGE  
SODA  
SPRINT  
ROLL  
BLIGHT  
MIXED  
SHIRT  
PUPPY  
COMMANDER  
ALFA

### U.S. NAVY RADIOCOMMUNICATIONS FREQUENCIES (USB/RTTY)

RTTY MULCAST consists of 16 channels 85Hz shift, 85Hz separation, 75 or 50 baud. NORMAL RTTY is 850 shift. Tactical ID's are typically letter-number-letter: ("Alpha 6 Uniform").

FREQ	USE	FREQ	USE
2130	U.S. Coastal	6697	Primary Night
2150	Harbor Control	6705	COMSTA
2434	Harbor Control	6708	Atlantic/Pacific Fleets
2550	Disaster Net	6720	ASW & Scrambled
2716	Harbor Control	6723	Universal
2732	Lockheed/Nuclear Subs	6742	ASW Atlantic
2745	NAVFAC Grand Turk	6746	PMFR Pt Mugu NAS
2838	Harbor Control	6799	Atlantic Fleet
3050	Air-Ground	7507	Hurricane Warning (pri)
3053	Ships/Tactical	7535	Atlantic Fleet
3088	ASW	7645	Disaster Net
3095	Atlantic Fleet	7885	ASW Atlantic
3109	Air-Ground/Secondary	7893	ASW Atlantic
3130	COMSTA Pacific	8233.5	NORATS Worldwide
3237	PMFR Barking Sands/Outrider Control	8757	TACSFAC
3261	NORATS Norfolk	8778	Atlantic Fleet
3265	Atlantic Fleet	8778	COMSTA night (primary)
4014	Air-Ground Atlantic	8972	ASW Atlantic
4045	NORATS Norfolk	8976	ASW Atlantic
4082	PMFR Barking Sands/Outrider Control	8981.5	Air-Ground Pacific
4253	Lockheed/Nuclear Subs	9002	Pacific Fleet
4359	NAS	9006	Atlantic Fleet
4373	Virginia Capes	9032	Pacific Aircraft
4377	Pacific Fleet	9037	Atlantic Aircraft (sec)
4416	Pacific Fleet	9257	Tactical
4491	PMFR Barking Sands	9260	Tactical
4622.5	NAS	9380	Atlantic/Pacific Fleets
4700	ASW Pacific	10730	Ops
4702	ASW Atlantic	11190	Tactical
4704	Atlantic/Pacific Fleets	11191	ASW Atlantic
4707	ASW Pacific	11195	Atlantic Fleet
4710.5	Air-Ground Atlantic	11198	Atlantic Fleet
4711	Air-Ground Secondary	11234	COMSTA RTTY Coord.
4730	ASW Atlantic	11252	ASW Atlantic
4735	PMFR Down range ships	11255	Atlantic Fleet
5080	PMFR Range Clearance	11261	CINCPAC
5430	COMSTA	11267	Daytime Primary
5446	USMC Tactical	11410	COMSTA
5716.5	Atlantic Fleet	11463	Atlantic Fleet
5718	Atlantic/Pacific Fleets	11570	Tactical
5724	Atlantic/Pacific Fleets	13147	Tactical
6693	Pacific Fleet	13169.5	Pacific Fleet
13224	COMSTA	13181	COMSTA
13227	Atlantic/Pacific Fleets	15087	Pacific Fleet
13237	Atlantic/Pacific Fleets	15520	Atlantic Fleet
13251	ASW Pacific	17985	Atlantic Fleet
13629.5	Tactical	18009	Pacific Fleet
15021	Pacific Fleet	23177	Pacific Fleet
15051	Pacific Fleet	23224	Pacific Fleet
15067	Tactical	23227	PMFR Down Range Ships
15077	PMFR Down Range Ships	23288	COMSTA

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## QSLs for Utilities

Utility monitors who engage in QSL card collecting as part of their listening activities will welcome an excellent book just published by Darryl Symington and John Henault. The book is titled, "Utility QSL Address Guide" and is priced at only \$12.95.

The authors have compiled a fantastic collection of information in this, the first volume, of a two volume set. Volume 1 covers "The Americas" and contains thousands of utility QSL addresses plus some very helpful "QSL Tips and Techniques." The volume will also serve to identify many utility stations through the use of the numerous callsign lists included within the pages of the book.

"Utility QSL Address Guide" can be ordered from various MT advertisers. Volume 2, which will cover the rest of the world, is expected to be published later this year.

## Special Interest Loggings

### 6226.2 kHz 082303Z CW

An unidentified station was sending VVV DNT AIT over and over. After several minutes of this he then sent BT BT and into cut number groups of 5 characters. Two errors were noted in the text where group 26 and group 66 both had an extra character (6 characters). In both cases, the character was the letter E. The cut number system in use was as follows:

1 2 3 4 5 6 7 8 9 0  
A N D U W R I G M T

Upon completion of the message, the station signed off with BT BT AR AR.

### 7754.6 kHz 141536Z RTTY 50-850

This was the ITT New York to Havana link with traffic consisting of mostly commercial telegrams in Spanish and English. Some diplomatic traffic was also noted with a message to the Afghan embassy in Havana. This was in 5F groups and the cipher text was transmitted twice.

### 10580 kHz 101436Z CW

This was another cut numbers message utilizing the same cut

number system as that observed in the 6226.2 kHz logging. After each ten groups of text there was a definite pause and then the next ten groups would be sent.

### 13379.1 kHz 131637Z RTTY 50-425

HGX42 (Hungarian Embassy, Tehran, Iran) was sending RY's to HGX21 (Ministry of Foreign Affairs, Budapest, Hungary). I am not certain if they ever established good contact because I dropped the activity after copying it for about 45 minutes.

### 13380 kHz 091832Z AM

YL/SS with "Atencion cinco, nueve, tres, cero, cero." After a few minutes this was replaced by "Uno, cuatro, cero, cero, cero" and then into 5F groups. There was a very loud background hum on the carrier. The station went down with "final, final" at 1846Z.

### 13413.4 kHz 091818Z CW

This station was somewhat sloppy and sent the characters in one continuous string so it was difficult to copy but this certainly seemed to be a unique cut number system. At least one I do not recall ever having heard before. The letters used were INTDAUS plus figures 4 5 6. However, the operator chatter was identical to the type seen on Vietnamese diplomatic links with the characteristic 2L, 3L, and 4L groups. The other end (unheard) must have been experiencing trouble with reception because the sending station moved down to 13419.4 kHz and continued with the chatter.

### 13636.3 kHz 061648Z CW/MCW

This was an unusual logging. Three single letter beacons were heard one on top of the other. The "P" beacon was in MCW; the "C" beacon was in "MCW; and a "D" beacon was in CW. On top of these beacons was some type of high-speed unidentified transmission. Some fading was noted for these signals.

## LOGGED APRIL 1987

KHZ	DTOI	MODE/IDENTIFICATION/COMMENTS
2806.3	110333	RTTY 75-850/RV's from RETJ, Madrid Naval Rdo, Spain
3073	042350	CW/Uniden stn rptng grps to ELE (?), 5 charac grps, Ltrs A-Z plus figs 2, 3 & 8 plus Spanish nyeh (MW)
3348.9	142350	USB/Navy MARS Net
3379	110346	CW/5L grps, FEMA Net
6248	100024	CW/Uniden stn sends 5F grps with bug, cuts zero as ltr T
6273.3	052149	CW/Uniden stn calls 7TA (poss 70A)
6313	110356	CW/Cipher text sent in continuous string, noted spec charac AA IM OT OE
6382	142333	CW/V DE TBA6 (Izmir Naval Rdo, Turkey)
6491	061703	CW/DE VCS (Halifax CG Rdo, NS, Canada) w/tfc list
6503	142326	RTTY TOR-ARQ 170/Sports news in EE from Chatham, MA
6840	082346	AM/YL-EE with 3-2F grps
7538.1	100028	CW/Uniden stn with 5F grps sent with bug, cuts zero as T
8570	171247	CW/Tfc list from WNU (Slidell, LA)
8666	171250	CW/CQ DE KLC (Galveston, TX)
9320	171244	AM/YL-EE with 5F grps
10451.8	171239	USB/OM-EE with WX for Hawaiian area sent to uniden aircraft
13364	131633	CW/Press items in German
13415.3	131643	CW/DE PCW1 (The Hague, Netherlands)
13529.2	131649	RTTY 50-170/5F grps
13923.5	061656	RTTY 50-425/QRA Y3D5 RV's (German DR frequency)
13997.5	091803	RTTY 50-425/Press items in EE (Poss from FTN99 Paris (Le Vermet, France-DIPLO, Press Svc of French Ministry of Foreign Affairs.))
14416.6	061643	RTTY 50-425/Press in EE (KUNA - Kuwait News Agency)
14419.5	061530	RTTY 50-425/5 charac grps, poss Arabic
14421.9	042036	USB/2 OM conversing in some type of Oriental language
14440	181420	CW/5F grps, auto sent, stn went down with 3 dashes sent twice
14444.7	042030	USB/2 OM-SS conversing re rdo equip & freq of 2182 kHz for Cozumel (Mexican location). This poss Mexican fishing boat activity
14507.8	132232	CW/RMGY DE RIW (Soviet vessel from Khiva Naval Rdo, Uzbek, SSR)
14520.3	181437	CW/Poss Vietnamese Diplomatic. Stn sends 2L 3L 4L grps noted in chatter by oprs of that activity
14555.8	131951	CW/PT Spanish, appears be Chilean stn
14580.3	061524	CW/5L grps, spec charac AA IM OE OT
14640.8	091710	CW/WX in SS, poss EBA Madrid Naval Rdo, Spain
18159.6	122140	CW/Stn rptng grps, poss Vietnamese Dip net, other end found on 13411.3 kHz, cut nbr tlc and 2L 3L 4L grp opr chatter
19155	061458	MCW/Musical marker of ten tones sent for hours, no other signals noted
19638	151509	RTTY 45-450/RV's (Poss Cuban/Angolan link)
19904.9	101648	CW/5F grps, hand sent. Other end not hrd

MT takes a closer look at...

## Those Mysterious Single-Letter Beacons

by K. Russell

In February 1985, *Popular Communications* magazine ran an interesting article by William Orr on the subject of CW single letter "beacons," grouped in eight 4-kHz bands and distributed within the shortwave spectrum. These so-called beacons became more intriguing when I found many of them were to be heard at my location in the midwest.

As I listened to the variety of different letters repeating themselves for days on end, my curiosity was heightened with regard to what purpose these stations fulfilled.

As the speeds were logged it became evident that some letters beacons were changing rate, yet others were remarkably constant. However, a day later any one of these (whether stable or variable when initially checked) could be operating in a measurably different speed range.

My method of checking speed consisted of a stopwatch timing the passage of ten consecutive letters (chosen quite arbitrarily). A stable speed does not need as many repeat readings; speeds which are not reasonably constant necessitate more samples to average out accurately.

### Some Speculations

Letters which exhibited a rising and falling speed over a short period suggested a wave motion. Could these devices be conveying information on the level of a body of water to a remote location? For example, could it be that a time of 20.53 seconds for ten consecutive letters sent represent a depth of 20.53 metres?

The next thought was that if this theory had merit then it may be possible to find related changes among several months of accumulated data for different letter stations which would indicate the passage of common rainstorms. I plotted out the numbers obtained from four stations -- C, D, O, and S -- which nearly always could be heard together at the same time of day, the assumption being that they might all be in the same general geographic area.

Nothing definite came from this exercise but what did show up was that all (except transmission O) exhibited a positive climbing trend through the spring of 1985. This gave me sufficient encouragement to believe that what I saw was indicative of a post-winter thaw and/or spring rains.

Figure 1 shows C and D increasing during March, then tapering off slightly into June. What happens after that is open to speculation -- could water release at a dam have produced the rapid fall?

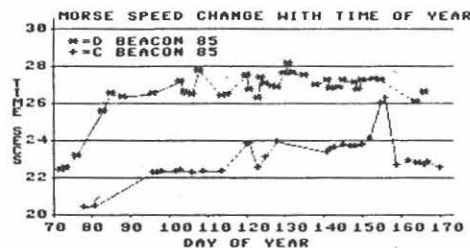


Figure 1

I knew that the theory would be considerably weakened if these transmissions did not behave in a similar manner in 1986; in fact, as the second year progressed, the general trend was the same.

It is generally accepted that these transmissions emanate from the USSR. It would, therefore, be very reasonable to assume that there are regional offices scattered around that vast country with need to know the water level in some relatively distant river, reservoir or dam due to the vital importance of this resource for such uses as town supply, hydroelectric power, agriculture, and inland waterway shipping.

Here at home many people listen to NOAA weather broadcasts providing similar information. The U.S. Coast Guard at Keokuk, Iowa, can be heard on 157.100 MHz at 1730 UTC giving out stage heights for about three dozen river locations within a 300 mile radius. The U.S. Department of Interior Water Resources Division monitors the Missouri River water level in Kansas City all day every day; they can produce a numerical printout showing the stage height from readings taken hourly (see fig. 2).

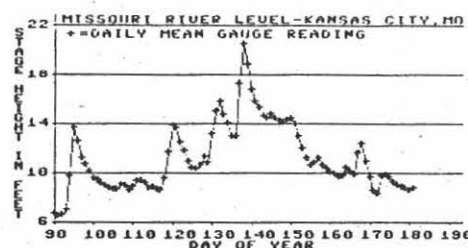


Figure 2

Probably the closest comparison to the Missouri River figure 2 plot is the signal put out by the F transmitter (fig. 3). Perhaps the water level at site F went through various significant reversals until it peaked in November. It would be difficult to argue that such speed variation is purely due to the vagaries of the transmitting equipment of even ambient conditions when readings like those are generated.

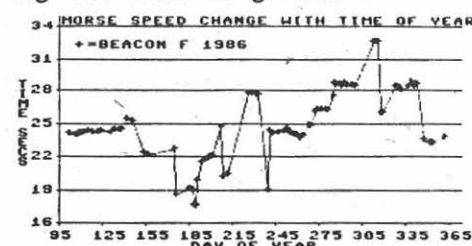


Figure 3

To reinforce that viewpoint, the behavior of station V operating on 10658.0 kHz last fall is of interest; on October 23, an almost imperceptible break in continuity was heard followed by a pronounced change in speed. Figure 4 shows the readings taken over 60 minutes are shown equispaced along the horizontal axis, ignoring the fact that more of the rapid CW readings were being logged in a given time span than the slower ones. While no explanation is offered for the sudden step change, it offers support to the main theme that speed variations are not just happenstance.

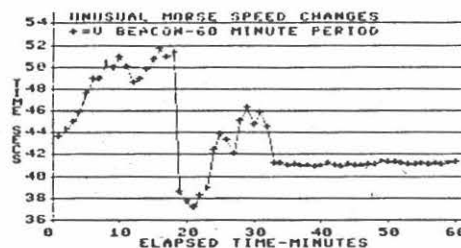


Figure 4

The Missouri River characteristics shown in figure 5 display general agreement with a sample drawing of S spot-checked for just over three hours (fig. 6) and the D signal over 45 minutes (fig. 7). Incidentally, D is normally as volatile as is shown, but there are rare occasions when it stabilizes. Perhaps that body of water is usually turbulent but sometimes it settles down like a millpond.

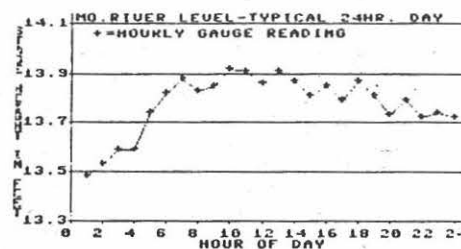


Figure 5

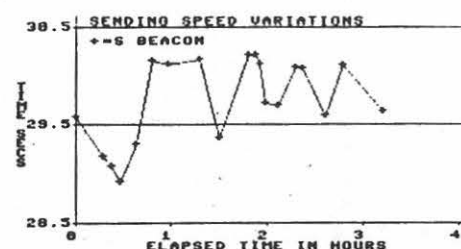


Figure 6

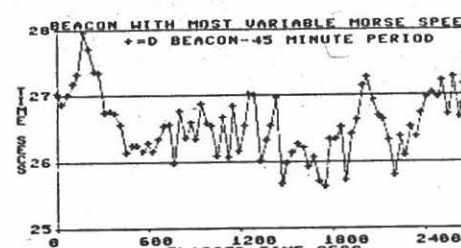


Figure 7

### Tentative Conclusions

1) Some stations may only send messages when they have something worthwhile to say; there would be no need to have the equipment beeping away needlessly with insignificant observations.

2) Key stations are grouped in eight clusters across the 3 MHz to 21 MHz bands, guaranteeing that the information will be received.

3) Directional antennas may be used for point-to-point reception. The two O signals on 10646.0 kHz come on the air for the same half-hour periods after taking a nominal 90 minute break. (At that frequency a slow O often runs about 31 seconds for ten letters and separate fast O timed at approximately 21 elapsed seconds for the same Morse content.)

According to conditions, either one or the other of the two superimposed signals may dominate both may be of equal strength.

Perhaps they are separately beamed sharply to the intended Russian listeners, but by the time they have circled the globe they criss-cross the North American continent.

4) Comment has been seen in print that the signals are possibly connected to military preparedness; however, the O stations change schedule with the European switch to summer time. This action seems to fit in better with communications monitoring duties than the great arm machine.

5) Some of these alphabet stations rarely break from the repetitious signals to burst forth with a few minutes of numbers. A natural explanation is that they provide useful complimentary data such as local meteorological readings.

6) Peculiarities such as the addition of the occasional dot or dash can persist for days or even weeks. These are probably faults which are not corrected quickly because of the remote location of the equipment.

Various theories have been offered over the years; could it be that a very simple explanation is being missed because a complex answer is being sought? The stopwatch data demonstrate a principle and no more than that can be claimed. Perhaps sufficient interest has been generated to encourage other listeners to monitor these mysterious signals.

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## Future of ARINC Questioned

The days of ARINC HF radio could very well be numbered -- or at least be sharply curtailed -- if a request before the Federal Communications Commission is approved.

ARINC has asked the Commission for approval of a global aviation communication satellite system that will provide air-to-ground service. Deployment of the system would begin in late 1991 and could be completed by as early as 1994 with a total of six satellites in geostationary orbit.

When the six satellites, called AvStars, are deployed, ARINC plans to sell or lease each bird's transponders to Aviation Satellite Corporation.

Each AvStar satellite will radiate two wide-area (global) beams and seven spot beams, serving high density air routes. According to the ARINC F.C.C. filing, both voice and data communication capacity equivalent to 400 voice channels would be made available.

Each AvStar satellite will use 14

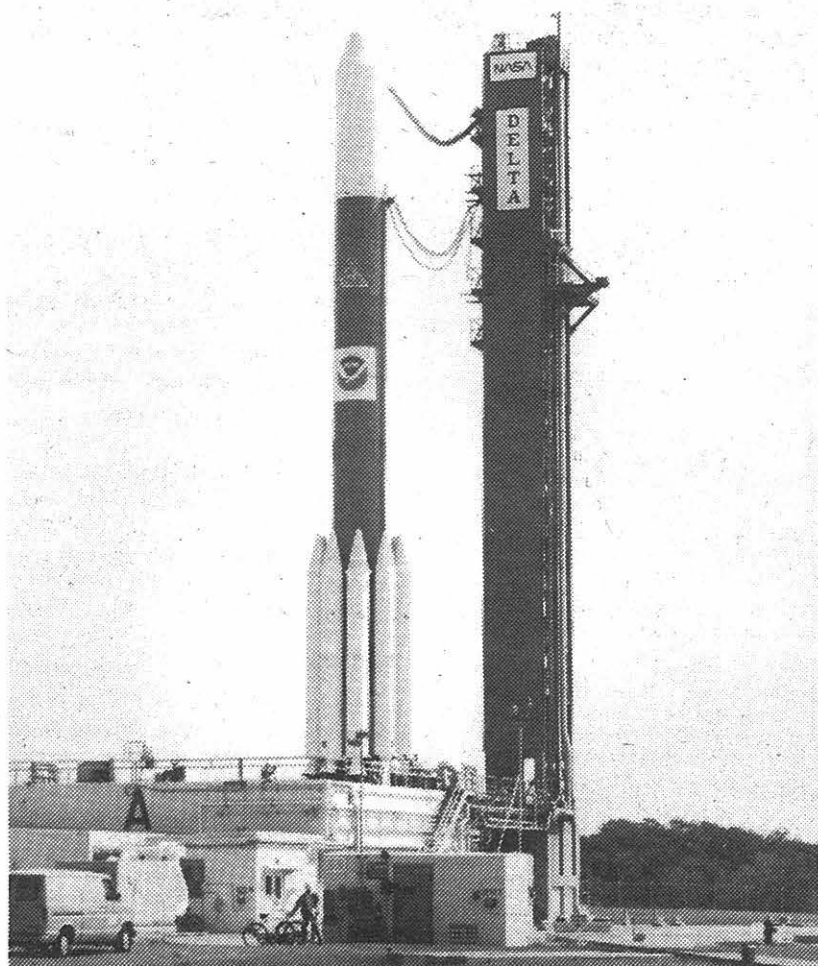
MHz of the L-band (1.5-1.6 GHz) segment reserved for aviation satellite services. ARINC's only other competitor, ANMARISAT, has reserved the other 14 MHz. The total space currently available for aeronautical satellite use is 28 MHz wide.

The proposed system will provide air traffic control and related services for the flight crew via voice and data communications. The satellites will also provide automatic dependent surveillance of aircraft.

This portion of the system will use on-board navigation systems to periodically transmit aircraft position reports to ground stations.

Additionally, each AvStar spacecraft would provide voice and data communications for en-route passengers. ARINC expects this service will eventually underwrite much of the cost of the AvStar system.

Each AvStar satellite is expected to weigh 2,866 lbs. (1,300 kg.) in orbit and will use the McDonnell Douglas Delta booster for launch.



*As NASA prepares to launch a rocket vehicle, several space-involved nations are taking a long, hard look at the safety records of their own launches. Repeated failures have recently grounded most of the advanced boosters which have made news around the globe.*

ARINC interest in deploying an AvStar system was sparked by United Airlines, following its acquisition of Pan American World Airways's Pacific routes. However, Northwest Airlines was the first carrier to subscribe to the service.

Motivation for an earlier than expected deployment of these satellites was due to the shooting down of Korean Airlines Flight 007 in the Fall of 1983.

If the FCC approves the system, the six satellites would employ overlapping geosynchronous orbits to assure that two spacecraft would be available to all aircraft flying at latitudes less than about 75 degrees.

The proposed sequence of satellite deployment would be at the following longitudes: 58W, 114W, 63E, 22W, 132E, and 173E.

### Deep Space Network Monitors Supernova

NASA's Deep Space Network (DSN) located at Tidbinbilla, Australia, connected by microwave to Australia's CSIRO Parkes Radio Telescope 200 miles away, is being used to observe the recently discovered supernova SN 1987A.

The two antennas, connected in real time, form a theoretical receiver the size of the distance between the two antennas in an operation called interferometry.

Dr. Robert Preston of the Jet Propulsion Laboratory, Pasadena, California, which operates the DSN for NASA, said an even wider network, using a technique called Very Long Baseline Interferometry (VLBI), has been established using four antennas; Tidbinbilla, Parkes, a Landsat ground station at Alice Springs in central Australia, and a 26-meter (85 ft.) dish at the University of Tasmania at Hobart on Tasmania, an island southeast of Australia.

Dr. Preston said a weak radio burst was detected during the first two weeks after the supernova's discovery, but that it died away, unlike any previously studied supernova. Supernovas generally turn into strong radio sources many weeks after the explosion. This occurs when radio emissions can initially penetrate the thinning cloud of material ionized by the explosion.

The DSN is awaiting that emission,

said Dr. Preston. It is thought to come from the expanding shell of gases from the star colliding with materials near it.

The supernova, an exploding star, was first detected on February 23 by the reception of atomic particles called neutrinos. It was first noted optically by astronomers the following day in the Large Magellanic Cloud about 163,000 light years away. It is the first such detectable star explosion in the neighborhood of our galaxy since 1604.

### Space Station MIR Update

On April 23, the Progress 29 unmanned tanker docked to the back of the Kvant module, marking the first time that four vehicles have been linked together in space. The complex now consists of the Soyuz spacecraft in front, followed by the MIR, Kvant and Progress 29. Cosmonauts Yuri Romanenko and Alexander Laveikin were expected to conduct an extravehicular installation of solar arrays on Kvant during May. Those arrays provide extra power for Kvant's magnetically suspended gyros, which will precisely point the modules instrumentation at astrophysics targets deep in space.

MIR's ground controllers have maneuvered the space tug propulsion module that delivered Kvant to the station into higher orbit. SFS reporter John Biro notes that 166.1625 MHz appears to be a downlink from the complex. Modulation is AM pulse width.

### USSR Rocket Grounded

The Soviet Union has suffered the loss of a heavy Proton booster and payload for the second time. An April 24 accident placed the three Glonass navigation satellites into a useless orbit. The 150 to 200 million dollar mission was a total loss. All of the world's largest launch vehicles -- the U.S. Space Shuttle, Titan, and Atlas; ESA's Ariane and Soviet Proton rockets -- are now grounded for accident reviews. Both the most recent Proton failure and the earlier January 30 mishap were both caused by malfunctions in the rocket's fourth stage.

The Soviets successfully launched a communications satellite March 19 on a Proton rocket -- after they believed they understood what caused the January 30 mishap. ■

## Remote and External Speakers for your Equipment

by Larry Wilan

Most scanner enthusiasts have their listening post set-up in that unused room or corner of the house which seems like the perfect location for monitoring the local police on a Friday night when all havoc is breaking loose. And the radio shelf, complete with a varied assortment of listening devices and accessories, stands there as a monument to each of us who wishes to keep tabs on the world in our own special ways. Everything from the latest 2-meter rig, to the current state-of-the-art scanner, to the finest reknown shortwave receiver may be represented here.

Unfortunately, as we all know, it is not always possible or practical to spend all the time we would like to in this little corner of the house. And, it is frequently not possible to place a receiver or an "auxiliary" scanner in each room of the house throughout the house (even tho' it is known to be done at times). So, to circumvent the expenses of such an endeavor (and to avoid being banished from the house by the wife), you may want to hook-up various external speakers in each of these places, and connect them to the receiver(s) located in the radio room.

### Location

The first thing to consider in any type of project as this is where the speaker will be placed, and that there is, in fact, room for it there. Just as with placement of speakers on your home stereo system, the location of the remote speaker will determine the quality, tone, and audibility of the reproduced sound (in this case, voice as opposed to music).

Though voice audio has a considerably less range in the sound spectrum vs. that of music, the same type of "rules" should be observed for both; that is, the higher-up the speaker is mounted (as on a wall, for example), the better the "high" tonal response will be while setting a speaker on the floor or, in a corner, will produce more bass response. Deficiencies in speaker response can be altered or corrected using this simple (but not always well-known) "rule-of-thumb". However, as the accoustical nature of each given room is different, some experimentation will be in order here. The old "trial and error" method will yield the best results!

Since speakers do not operate by telekinesis, it will next be necessary to plan a route for the wiring to connect the speaker(s) to the desired radio receivers. Wiring can most often be routed under the flooring by drilling small holes both near the receiver, and at the speaker locations respectively. If this is not possible (for whatever-odd reason), other alternatives may include running the wires under rugs or carpeting, or, along baseboards from room-to-room. Even several of these methods may be used in unison to achieve the desired end results!

### Other Considerations

O.K., now the wiring is run, and dreams of whole-house monitoring is about to come true! But, as with all do-it-yourself projects, there are a few more things to consider before the sounds of your scanner comes blaring through the basement workshop.

Check the impedance of your scanner or receiver before attaching any type of speaker to its speaker output jack. If the impedance matches, you are home free. If it does not, do not connect it up until you research a solution to the mismatch through any of the many excellent books covering home stereo installations and problems arising from such installations (books are available on this subject from nearly all hobby radio stores for a pittance). Also, bear in mind that impedances may change even when adding several speakers of the proper impedance in unison. When in doubt, research it before destroying the audio section on your megadollar equipment.

Another main consideration of the installation should be that of how to regulate the audio in a remote location so you can lower the volume to hear the wife yelling at you about drilling holes in the floor! Unless you like to run to the radio room to adjust the volume each time you need to, either some type of home-made "L-pad" or volume control of a commercial nature should be installed at each remote speaker location.

Some commercially-produced remote speakers even have these already built-into them. And, don't forget to install some type of switchbox arrangement inline to

shut-off those remote speaker terminals not in use. After all, your spouse may not want to listen to the local police while in the bathtub!!

Plan several hours, if not a weekend afternoon, to complete the project from start to finish. Take time and plan all phases in advance. Check "compatibility" of all the components involved, and get set to enjoy the thrill of being able to monitor your favorite services anywhere throughout the house. And the whole thing costs considerably less than even one cheap crystal scanner! Now if my wife will just let me back in the house to enjoy it all! (Just kidding, dear!!!).



### A Profile of the Author

Many readers have enjoyed the array of short articles and modification hints from Larry Wilan in recent pages of MT. For those of you who wonder what Larry looks like, the accompanying photo was sent in by the author.

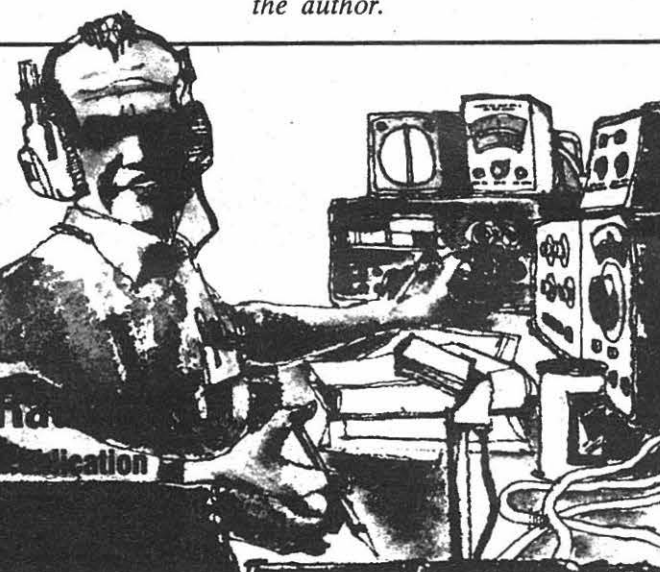
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# ON THE HAM BANDS

## THE HISTORY CONTINUES - The 1930s and World War II

### Progress in the Thirties

After the huge technical advances of the 1920s, the arrival of real radio laws in 1927 and 1934, and with the advent of the depression (and its forced leisure time), amateur radio grew rapidly.

Radio parts and equipment were relatively cheap and "complete" receivers and transmitters were now available (all in one box!). And (in 1932) a new form of communication, television, was available in kit form for those who really wanted to be the first on their block to try something new.

Even as the number of amateurs was growing by leaps and bounds, so too was amateur radio growing up--and settling down. With the new regulations (which were actually enforced!), the revised license classes, and operating (rag chewing & DX)/traffic handling as the major thrust of amateur activity, amateur radio was changing.

Technical skills and achievements were still of interest and widely practiced. And speaking of technical achievements, "single signal" was the main watchword for

receivers in the mid '30s as true selectivity was discovered.

Phone work continued to get better, too, as modulation methods were improved and efficient, 100%, high-power modulation became practical.

Perhaps the biggest technical change was the start-up by many manufacturers who provided completely manufactured products. Many hams started buying ready-to-use receivers, transmitters and accessories. The slow, inexorable march from "build it yourself" to "buy it yourself" (especially for receivers) was on its way and by the late '70s it would arrive in the area of 98%!

The leaders of this march were the many hams who liked to operate, but not to build. They wrote letters of complaint to the editors of the several ham magazines of the time to state that there were too many technical articles and "not enough operating articles." While good technical articles continued to be published, more contest, traffic, DX, etc. articles began to show up.

The license classes during the 1930's were changed to Class A, B and C. Class A had the phone privileges on 80 and 20 plus all Class B privileges. Class B, the equivalent of today's General, had all the rest of the privileges. Class C was a "test taken by mail" version of Class B.

The test for each class was only 10 questions, but essay type. And there were hundreds of questions in the test question pool so you never knew what questions you would get!

The code test was 10 wpm until the ARRL board convinced the FCC to raise it to 13 wpm; a significant change. Farnsworth had not yet discovered why the "wall" existed at 10-12 wpm and, while anyone could quickly get to 10 wpm, 13 wpm was a real effort!

As the '40s approached, Field Day (started in 1933), traffic handling, emergency communications (there were lots of floods in the U.S. during this period, including one which wiped out the ARRL's station leading to the construction of the current building in Newington in 1938), Army and Naval Reserve

Mike Mitchell, Jr., W7WHT

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Seattle, WA 98102-1279

radio activities, rag chewing, and DX were the major activities of the average ham.

Plenty of technical experimenting in the VHF area and receiver/transmitter refinements were accomplished, too, but operating was the emphasis by 1939.

### The War Arrives

In September of 1939 we suddenly learned that the "war to end all wars" wasn't, and we started a numbering scheme to keep track of them!

Due to the neutrality laws in the U.S., we lost half of the DX countries immediately. Hams from Blaine (WA) to Buffalo (NY) could no longer work that foreign DX a few thousand yards up the road called Canada.

Five hundred amateurs went to work for the FCC in 1940 at monitoring stations. The military reserves started a heavy recruiting drive for hams and all hams had to provide fingerprints, photographs and proof of citizenship. Of the

## CONVENTION CALENDAR

Date	Location	Club/Contact Person			
Jul 5	Wilkes-Barre, PA	Murgas ARC/ Jeff Dent KB3JK	Aug 2	W. Mifflin, PA	South Hills Brass ARC/ Doug Wilson WA3ZNP
Jul 10	Atlanta, GA	302 Bi Centennial, Wilkes-Barre, PA 18701 National Convention/ Sandy Donahue WA4ABY	Aug 2	Berryville, PA	185 Orchard Ave, Emsworth, PA 15202
Jul 10-12	Minot, ND	2805 NE Expway Apt B-27, Atlanta, GA 30345 Int'l Peace Garden/ William Feist III WB8BZH	Aug 7-9	Austin, TX	Shenandoah Valley ARC/ Rob Kinsley NT4S
Jul 11	Poughkeepsie, NY	c/o Book Trader, Dakota Wq, Minot, ND 58701	Aug 8	Ripley, WV	P.O. Box 139, Winchester, VA 22601
Jul 11	Eau Claire, WI	RR 2, Vanessa Lane, Staatsburg, NY 12580	Aug 8-9	Hays, KS	Talk-in 146.22/82 and .52 simplex
Jul 11-12	Indianapolis, IN	Eau Claire ARC/ Lisa Hauch-Harper KA9RII	Aug 9	Marion, IN	West Gulf Div. Conv./ Joe Makeever
Jul 11-12	Lake Canton, OK	514 Fall St., Eau Claire, WI 54703	Aug 9	Warrington, PA	8609 Tallwood Dr, Austin, TX 78759
Jul 12	Downers Gr, IL	Indiana Hamfest/ Cornelius M. Head	Aug 9	Indianapolis, IN	Jackson Co ARC/ Geneal Bailey NK8P
Jul 12	Bowling Gr, OH	9046 Mercury Dr, Indianapolis, IN 46229	Aug 9	Willow Spgs, IL	Ripley, WV 25271
Jul 12	Pittsburgh, PA	Lake Canton Field Day/ Tim Mauldin WA5LTM	Aug 9	Georgetown, KY	Hays ARC/ Robert Pletcher, NN0N
Jul 12	Alexander, NY	P.O. Box 19097, Okla City, OK 73144	Aug 15-16	Huntsville, AL	1104-C E. 17th St., Hays, KS 67601
Jul 12	Newtown, PA	Talk-in 146.52 simplex; Fairwv rpt 144.85/145.45	Aug 16	Springfield, MO	Grant Co ARC/ Wm. Brooks Clark
Jul 19	Augusta, NJ	DuPage ARC/ Ed Weinstein	Aug 16	Georgetown, DE	2202 So. Boots, Marion, IN 46953
Jul 19	Wheeling, WV	7511 Walnut Woodridge, IL 60517	Aug 22	Oakland, NJ	Mid Atlanta ARC/ John Bartholomew WB3ELA
Jul 19	Washington, MO	Wood County ARC/ Ross Mergenthaler NS8C	Aug 22	Victoria, TX	203 2nd Ave, Broomall, PA 19008
Jul 24-25	Topsfield, MO	2782 Joseph Rd, Pemberville, OH 43450	Aug 22-23	Madison, GA	Shadow of the Pyramids ARC/ Dave Johnston
Jul 25	Marquette, MI	North Hills ARC/ Robt Ferry Jr N3DOK	Aug 23	Tacoma, WA	Indianapolis, IN 46268
Jul 25-26	Anselmo/Victoria	9821 Presidential Dr, Allison Park, PA 15101	Aug 23	Mullica Hill, NJ	Hamfesters RC/ John Schipitsch W9BNR
Jul 25-26	Jacksons Mill, WV	Genesee RA Batavia Hamfest/ Colin Ware	Aug 29-30	Marysville, OH	13058 Finch Court, Lockport, IL 60441
Jul 26	Belvidere, IL	60 Spencer Court, Batavia, NY 14020	Aug 30	Saginaw, MI	Bluegrass ARS/ Scott Hackney KI4LE
Jul 26	W Friendship, MD	Penn Wireless Assn/ Paul Gondos KA3JOI	Aug 30	Bluefield, WV	629 Craig Lane, Georgetown, KY 40324
Jul 31-Aug 2	Jackson Hole, WY	23 Hunt Rd, Levittown, PA 19056	Aug 30	Danville, IL	Alabama State Conv/ Jim Brashear
Jul 31-Aug 2	Okla City, OK	Sussex Co ARC/ Donald Stickle, K2OX			3002 Boswell Drive, Huntsville, AL 35811
Aug 1-2	Cedar Rapids, IA	Weldon Rd, RD #4, Lake Hopatcong, NJ 07849			SW Missouri ARC/ Dave Christiano NE0B
Aug 1-2	Asheville, NC	Triple States RAC/ Ralph McDonough K8AN			2511 E. Grand, Springfield, MO 65804
Aug 1-2	Jacksonville, FL	Box 240 RD 1, Adena, OH 43901			Sussex ARA/ John Low K3JL
		Zero-Beaters ARC/ Ken Bowles K9OCU			Rt 2, Box 244G, Georgetown, DE 19947
		14 Geotown, Union, MO 63084			Warren ARA/ Sandy Melton KC8RM
		Heavy Hitters Hamfest/ Richard Palm K1CE			4595 Bonnie Dr, Warren, OH 44485
		27 Green House Blvd W, Hartford, CT 06110			Ramapo Mt ARC/ Sol Silverman KA2VBZ
		Hiawatha ARA/ James F. Jacobson WD8D			800 Godwin Rd, Paramus, NJ 07652
		105 Raymbault Dr, Marquette, MI 49855			Victoria & Pt Lavaca RC/ Carroll Paschall
		Sprgs, NE/ Central NE ARC/ Harold Curtis			1709 Poplar, Victoria, TX 77901
		NESR Box 136, Anselmo, NE 68813			Confederate Signal Corps/ Roy Jordan WB4ILR
		W. Virginia State/ Albert Hix W8AH			1146 Shoreham Dr, College Park, GA 30349
		860 Alta Rd, Charleston, WV 25314			NW Division Conv/ Jerry Seligman W7BUN
		Big Thunder ARC/ James Grimsby W9HRF			12306 80th Ave, East Puyallup, WA 98373
		210 Oak Lawn La, Poplar Grove, IL 61065			Glouster Co ARC/ Michael Black N2FIZ
		Baltimore RAT/ Bob Bennett W3WCQ			Mullica Hill, NJ 08062
		626 Lake Dr, Towson, MD 21204			Union Co ARC/ Gene Kirby W8BJN
		51 Buckhorn Flats Rd, Riverton, WY 82501			13613 US 36, Marysville, OH 43040
		OK State Conv/ Rob Runyan AA00			Great Lakes Div Conv/ Joseph Turner
		RFD #2, 67013 Tipi, Yukon, OK 73099			423 N. Granger St., Saginaw, MI 48602
		Cedar Valley ARC/ Tom Zuber WN0DRC			Platinum Coast ARS/ George Livingston
		4201 Dalewood Ave, SE Cedar Rapids, IA 52403			720 S. Dorsey Pl., Melbourne, FL 32935
		West Carolina ARS/ Earl Elliott KI4UO			East River ARC/ Charles Gatchell KE8EI
		17 Emmery Rd, Asheville, NC 28806			24 Fairfield Place, Princeton, WV 24740
		N.Fla. Section Conv/ Wayne Oehlman WB3DBE			Vermillion Co ARA/ Chris Stonecipher KA9VMN
		11649 Mand.Terr.Rd., Jacksonville, FL 32223			Danville, IL 61832

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50,000 hams at that time, about 100 lost their licenses.

Even with neutrality we were doing what we could to help and parts were in short supply. "Civilian Technicians" (mostly hams) were recruited to help the British with radar work. Civil Defense and other needs were recognized and developed, too.

Within hours of the attack on Pearl Harbor on December 7, 1941, all amateur radio activity went silent except for a few stations like W1AW which provided bulletins about war and military information for hams (it was easy copy with no QRM!) and stations supporting local emergency communications. Even those were silenced on January 10, 1942.

By March of 1942, some 14,000 amateurs were on active duty in the military. Many received direct rank or rate with little military training. One day a civilian, the next day an E5, E6 or E7, or O2, O3 or O4!

With equipment in short supply, the military simply bought, for cash, huge amounts of commercial receivers, transmitters and related equipment directly from the hams. It was a quick and successful effort to get equipment fast and the hams often followed their own equipment into the service!

During the war, civilian hams joined the Civil Defense War Emergency Radio Service which was strongly supported by ARRL. QST quickly became the defacto radio information magazine for both Civil Defense and the military services.

All this activity was either encouraged by, lead by, or set up by, the ARRL for the government. They also had a lot to do with preparations and frequency allocations which were to be available after the war as well. Within 4 days after the end of the war we were back on the air; it had been one year after World War I! The ARRL performed brilliantly during this period--it was their finest hour!

*Next Month: The 1940s and 1950s.*

## PACKET RADIO - Part 1

Nine years ago, VE7APU started transmitting strange-sounding beacon signals from British Columbia. He was able to do this because, unlike the U.S. hams, Canada saw where ham radio was headed several years ago and set up a new NO CODE license class which allowed digital communication on VHF/UHF frequencies. It was strictly for the rich and experimenters at first as equipment was almost nonexistent and very expensive.

The license itself, however, was no give-a-way; the test was written so that only those willing to become well versed in digital techniques could pass. As you might guess, the early rush to get this license was not staggering.

A few Canadians in British Columbia pooled their resources to design a specialized controller (a special purpose microprocessor) so they could make use of the digital mode called "packet", and a group of amateurs in Tucson, Arizona, formed a non-profit organization to develop a practical approach to transmitting and receiving packet at a reasonable price.

The Tucson group had help from hams all over the U.S. and Canada and soon designed an inexpensive terminal node controller (TNC). After working under a special authorization, the FCC approved the use of packet for all hams and the Tucson group made their equipment available to the average ham.

Meanwhile, back at the marketplace, everyone was getting into computers. Commodore, Radio Shack, Atari, and Texas Instruments provided plenty of inexpensive computers to meet this demand.

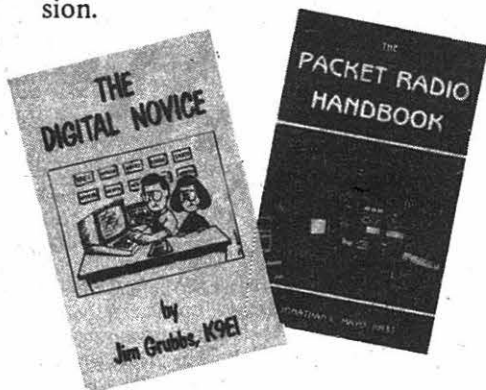
As the prices of computers came down with volume, so did the price of TNCs. Several other manufacturers started building TNCs, too, and the price was soon within the budget of most hams and SWLs.

It all seemed to come together at the Dayton Hamvention in 1985. All those hams with computers suddenly realized that they could put their computers on the air in a way which was useful, efficient, rapid, and fun.

In the two years since that Dayton meeting, packet radio has simply exploded. Suddenly thousands of hams want to be the first on their block with a terminal node controller. So let's take a closer look at all this packet stuff.

## Packet Technology

Packet is a form of digital data communications like RTTY. To make it work you need a computer or terminal unit, a TNC and a transceiver (or receiver if all you wish to do is monitor packet). It is the natural evolution of digital transmission.



We started with CW (a digital mode), then RTTY (Baudot), then ASCII, but each mode had its problems and was limited as to speed and transmission accuracy. Hams never tried much to reach the upper limits of speed capability, being satisfied with 60 or 100 wpm since equipment with that capability was readily available and the increased speeds were not much faster anyway.

When microcomputers became popular and relatively cheap, the mechanical limitations of RTTY and ASCII were suddenly gone and the speed and accuracy possibilities of amateur digital communication considerably increased.

Just like telephones and RTTY, computers can be networked using packet and communicate with each other. While the technical aspects may seem complicated at first, they are very logical. In operation it's really quite simple and the main advantage is that it is error free--what you send is what they get. If not, it keeps doing it until it gets it right!

Packet is also very fast, so fast that several stations can share the same frequency talking to other stations in different QSOs without interrupting each other. And it can work for you when you are not there by sending and receiving messages automatically.

If you look at a picture of a network, you would see a bunch of lines connecting thicker dots which represent each station in the net. The dictionary defines "node" as a widened or thickened place, thus accounting for its name. But what does it do?

For those of you who are into computers, the answer is easier. It's a special purpose modem. If you are not into computers, your next question is probably, "What's a modem?" The most straightforward answer is that it's a modulator/demodulator. But it's still more than that.

A TNC is really a special purpose computer which performs a series of tasks which allow your transceiver or receiver to operate in a packet mode. "Fine," you say, "But what exactly is a packet?" Well it's one or more frames! "Brilliant," I hear you say; "How did I get into this in the first place?"

## Back to Basics

In teletype over radio or wire, we send a set of start-and-stop signals, in between which we squeeze a set of on/off, high/low, etc. signals consisting of five or seven bits of data which make up one character. Each time you hit a key on the keyboard this happens. The five segment system is Baudot and the eight segment system is ASCII.

These old systems waste a lot of time and data starting and stopping and the like. Packet is much more sophisticated and not only runs at a faster rate, but puts more information into the same amount of transmission time. The effect is that instead of starting and stopping for each character, it sends many characters (up to 256 at a time). The old method is called asynchronous; the newer method, synchronous.

The TNC makes up the packet from what you have typed into your terminal/computer and, using the X.25 protocol developed by telephone engineers (who, doing it for money, designed protocols that get the mostest through the fastest) sends it to whomever you have chosen to get it 12 times faster than RTTY with no errors!

Effectively, then, you have typed your asynchronous thought into your terminal/computer which in turn, fed the information to the TNC which converted that info into synchronous frames of information set up in accordance with the protocol. The TNC then gathered the frames together, bundled them into a packet, keyed your transmitter, and sent it out, all within a fraction of a second! But that's only transmission.

When receiving, the TNC reverses the process, but adds a few steps. In accordance with its built-in protocols it checks the incoming packet for errors. If everything is OK, it keys your transmitter and sends to the sender, "Good show mate got that one fine" in its own binary language, revealing the message to the screen of your terminal/computer.

If the packet had errors, it would send a "Tough luck mate, but that just won't do; try again" message and, until it gets one without error, nothing shows up on the screen.

Most of this happens at great speed and you hardly notice the occurrence of an occasional bad packet. If the signal strength is good, most errors will be few and between (he said with a prayer).

We have just scratched the surface so far as the technical aspects of packet and what it can do. Whole books have been written just on the subject of one part of the protocol X.25. A really good overview of packet in easy-to-understand language is *Get Connected* by Jim Grubbs, K9EI, from Qsky Publishing; P. O. Box 3042; Springfield, IL 62708 or your local ham store. It was written for beginners.

*Next Month: Packet Radio Part 2 - Operating Procedures (or: you sure this is in English?)*

Keep those cards and let them come. Write one now!

## RTTY Loggings

RTTY Logged in Ormond Beach, Florida, in April 1987. Frequencies are for Hi Tone reception

contributed by Fred Hetherington

5102.8	JMG2 Tokyo	50/850r; meteo msgs, 100% copy 0935	12088.8	6WW Dakar	T850A (DRI or SGI), Channel B (SGI) msgs FF to Paris from Dakar, Cap Vert and Port Bouet 1100-0000 (RFTJ, RFTJC and RFTJF)
5946.4	? ?	T170A&B channels idel 0900-1030. Off before 1100.	12131.7		About the only 57 baud network without encryption on the HF band. Most of the stations are in Mexico, one or two in Southern California. Most msgs are in SS, some in EE. The msgs relate to shipping or air travel. Try 57/170n 2000-0200.
7817.7	SNK Kano	50/650r; ry 0245. It took a little detective work to identify this fellow. His tape was running backwards and "5" came thru as the letter "T". "YRYRYRYR KNT KNT ED IMI KRG". T for 5 is a normal letter-figure transposition. T350; very strong, idle, off 1100. MSS? Belize?	12146.4-47.9	MKK London	Multichannel vfct system. 50/170n&r; fox on all channels 2010.
7821.3	? ?	50/425r; IRNAQ Nx EE now on later. Accused Iraq of chemical warfare. Good copy. 2115	12173.55	PWZ-33 Rio	50/910r; ry fox - off 0105. No month seems complete unless we find PWZ-33 on a new frequency. This is it for April.
7960.1	EPD5 Teheran	50/425r; Wx msgs from Offenbach Meteo Com. Centre, Meteo identifier EDZW. Off 2157	12214.0	OMZ(?) Prague	75/425r; Telex EE about the wonderful benefits of the Mijail Gorbachov visit to Prague. Tlx ended 2100. Then same TLX is SS to Mexico after shifting to 75/425n. Note the SS spelling of Mijail. Off 2126 with 73 GB.
7997.2	DD?	75/850r; very quick brown fox. 1207. Strong, U.S. Navy on several new freqs lately. NSS to Argentina, Nfld.	12223.7	VOA Tangier	75/425n; Nx AA 0100
8023.85	NSS Washington	50/425n; ADN Nx EE. 2222	12263.7	Korean embassy	50/425n; Msg in Korean ends with Gim Bong Zu 1987 Nyen 4Uel 20 il Pyeng Yang. QRU at 1213, then to CW
8067.5	Y2V7 Berlin	50/500n; Wx msgs fm Meteo Stn RUTK. 0050	12265.67.8		A VFCT system, all channels 75/170n and all carrying "fox" 1700-0000. My guess, ZPN Asuncion to Rio.
8085.2	ROM5?Tachkent	50/515n; KCNA Nx FF. 1240. Poor reception.	11261.9	28Y & 28G (in //)	50/350n "TUH de 28Y 28G" Then ry and short msg, SS, then USB fone, SS testing, counting, etc. 2015. No FF used so the "TUH" may not be Abidjan. Did not find the other freq. so I still don't know whether this channel is 28Y or 28G.
8152.0	HMF86Pyongyang	50/170n; ry to "Wladiwostok". 0950	12324.0	LOL? B.A.?	75/425n; meteo (EWR) Wx msgs from "SMAG" - a meteo ident. which I cannot identify. 1200. See next item.
8297.6	ULKBUSSR ship	FEC & signing CW. Strongest signal in the 8 Meg maritime band at 0945!	12326.0	LOL? B.A.?	75/425n; meteo (EWR) Wx msgs from SABM (B.A. Met. Centre) 0140
8711.5	VIS68 Sydney,Aus	Santiago (ISA), Wx from SCIP (85469). To USB fone at 0902.	12419.5	CBBFH Santiago	T170B msg SS and off 0045. See 11298.5 item.
8820.2	CAI73 Isla de Pascua (Easter Island);	50/425n; meteo msgs to Kilo) 50/850n; ry to P2X (Papa Dos X-ray). Talks SS then off 0930	12526.9	HCPT Ecuador	FEC Nx SS in progress at tune in, 2230. Was from UPI and "Servicio de Prensa de la M/N Provincia de El Oro, HCPT." Twas for Navy personnel and ran about 30 minutes. My map of Ecuador shows the Provincia de El Oro to be in southwest Ecuador along the coast. A coastal town of Puerto Bolivar may be the home of HPCT. Maybe you know better.
9027.4	C3K (Charlie Tres	50/425r; (new freq) ry QJH1 tfc garbled. Moved about 3kc 0130	12693.3	980QJ Madrid	75/850r to 95XRA 2010. This week the callsign changes again. Oldtimers may remember this fellow at EBA. It has been quite an evolution.
9923.4	TJK Douala	75/850r; "FAAG de FUJ" "RFHICW de RFHID" 0915. It is believed that both stations are in Noumea. Then came a storm warning to Wellington, N.Z. in EE, also to HMSNZ Southland and Awarua Radio. Then a general Wx bulletin in FF.	12877.4	UJY Kaliningrad	50/200n; Msgs RR to ships, 1715. Usually uses CW here.
9290.3	FUJ Noumea	50/1000r; meteo msgs for Siberian Wx stns, but not quite the usual WMO format. 0100	13002.5	CTU2 Monsanto	50/200r; CQ // CTW8 and CTV7, then meteo msgs 1800. (CTW8 and CTV7 were not coming thru on their "callbook" frequencies. Let's assume they were on other frequencies not yet listed.
9290.4	RTQ78 Sverdlovsk	Check this 37-baud, 240 cycles shift station usually sending yyyyy all evening. This logging is at 0040.	13128.0	HJN2 Bogota	ARQ "Computer RTLX" Nx SS ends 0025 (previously logged with Nx SS on 22600.0 at 1907) Anyone care to explain Computer RTLX Nx?
9336.0		75/850r fox, count. New channel here. Also the usual companion channel 4kc higher, 9349.4 75/850n 0020	13290.0	CLP--	Unidentified Embacuba 5D code groups to CLP-1 - who was replying on 13925 kHz 2215.
9345.4	KRH51 London?	50/290n; meteo wx msgs for airports in Vietnam then India. 1030	13528.8	N? US Navy	75/850r; ... very quick brown fox... soak test on new channel. My guess: NBW or NOX.
10298.1	HSW62 Bangkok	50/425r; ry. Copy 100% at 1245 then deteriorating rapidly. He said good-bye at 1300 to ROK GB SK.	13580.0	HMF35Pyongyang	50/300r; APA and KCNA Nx EE now comes thru nicely at 2150. Still on and even better reception at 2210.
10600.1	BAC27 Beijing	75/235n; msg Polish to Ambassador in "Paryz". 1308	13602.3	SOI208 Warsaw	FEC Nx Polish ends at 1850 - callsign changes to SPW as he goes to ARQ and CW for telex business
10656.0	SNN299? Warsaw	50/280n; promptly at 1500 signs on with ry, then msg SS to CLP-2 Panama, followed by encryption.	13626.1		An unknown, avoiding identification, 50/425r; 5-letter code headed by 06/04/1950 at 1820. His local time was UTC +1-1/2. To CW and off 1825.
10670.0	CLP-1 Habana	75/850r; testing new channel with the usual line: NRKNSO...followed by ..the very quick brown fox... 1530. Off about 1600.	14355.5	SAM Stockholm	75/425r; Nx Swedish ends 1704. This was same nx program copied here earlier on 14355.5. This 14364.5 is a new channel here.
10703.3	N?? US Navy	50/520n; ry 1200 then contact with correspondent - long pauses. Several OK's. Uses EE radio abbreviations like GA, FM, etc. One callbook says Wicks, England. This is not Wicks. Carrier still on 1300	14473.85	Who?	T335A&B idle; 1700 until off about 0000. Another day T380A&B idle, same period. No clues either day. You tell me. Only government stations could afford to run idle TDM channels so long without traffic. Early on third day I caught him tuning up at 1030 - but no words. Off 1033!
10900.3	GKR2 East Asia?	75/425n; ARF File Nx EE 1625. First time logged here on this freq. where WBR70 used to hold forth. May he rest in peace.	14501.6	Moscow	T425A; Msg EE to Islamabad, 1435. For the Pakistan end of this service tune to 17381.9, T96/200A, coming in well here but not quite as good a signal as from Moscow.
10950.2	VOA	T415B Nx FF of interest to Defense Forces from RFFAB La Regine 2130-2200	14512.7	AEM1AC Germany	45/170r; MARS msgs to folks back home on this new frequency 1350.
10949.7	FDX Villacounlay	50/425r; TASS Nx AA in progress at 1930. Now on earlier	15041.6	YSK?	ARQ weak and noisy. Mostly encryption or garbage. Off 1245.
10984.7	RCB53 Moscow	75/170n; maritime wx in great detail in SS. 1020. When LOR left the air CLN320, Havana, then took over the channel with fox and ry.	15826.9	SNN299? Warsaw	75/245n; Nx Polish at 1315. At 1325 went to CW, asking for ry from correspondent.
11070.0	LOR Pto Belgrano	Fort de France T850; (Circuit Indicators on both A&B channels to Paris are now FDI, 2200-2300. An interesting msg FF, RFHIG, Tontouta, to RAYWCX, MIL FRANCE, Canberra, Australia 0900	16107.5	HBD20 Berne	ARQ; Feb log showed SFAE Nx GG. We now find the Swiss Nx FF, 1445 (Journal du Geneve)
11109.2	FUF (RFLI)	50/850r; ry 0145. (Registered with ITU for 11114.4)	16117.2	6VK317 Dakar	50/425r; Malawi Nx FF - The news agency credited was "Radio Blantyre", 1600-1630.
11110.2	LZG2 Sofia	"Todos Bucaneros" net, T130B, msg SS to CBDFE at 2345. This rtty net uses many frequencies, some logged here are: 5433.5 5528.5 6529.5 6923.5(Antarctica) 8984 9203.5 10296 10411.5 11233.5 11298.5 12053.1 12419.5 13588.5 13918.5 14603.5 14886.5 15473.4 All TDM2	16128.3	?	50/1000n; Czech(?) language. Off 1500. Mentioned King George.
11298.5	CBFFA Chile	(1030) Mode of operation! Msg to NN0EID 1445	16136.7	Asiatic embassy?	50/500n; 5-digit code groups 15055-1535, then Asiatic language. To CW at 1555.
11401.4	NNN0GKF US Marine Corps	A multichannel VFCT system. At 0100 set your baud rate to 45, use your very narrow filter and set your shift as low as possible. At a shift of 59 cycles the channel at 11407.6 can almost be read if you have a very narrow filter in radio receiver.	16302.1	Belgrade	75/425n; // 18045.1 The "DFZG" call to attention, then ttc to embassies. Sign off at 1526.
11407.6-9.6		50/510r; VNA Nx FF ends 1220, Nx EE starts 1230. The FF and EE items were datelined Hanoi VNA two days earlier! Someone put the wrong tape on the machine - or maybe Vietnam News Agency does not provide news on Saturday and Sunday (It is now Sunday). This is a new frequency, "VNA86" used to transmit this VNA nx program on 11420 (logged here at 11419.4). Nx EE ended 1305 and Nx VV started.	18032.1		Interesting. ARQ/400. Used to be 75/425n, 1500-2000. This one off 2000. South American embassy(?) to Prague?
11410.0	.86? Hanoi	50/530R; VNA Nx FF, started at 1200 after an announcement in EE that Nx FF would start at 1200. This item was logged several days after the 11410.0 item above.	18045.1	Belgrade	75/425r; "DFZG" ry // 16302.1 msgs to embassies. Off 1526.
11420.0	VNA86 Hanoi	Warsaw adds another Nx program in Polish 1835	18421.4	LQB54 B.A.	50/850n; TELAM Nx SS, 100% copy 1925
11423.5	SOL242 Warsaw	50/85n; msgs FF to Hanavave, Noumea, Atuona and other southwest Pacific French Polynesian locations. 0100.	18614.0	CLP-18 Dar es Salaam	African Nx about Cuba, SS to Minrex. To CW 1840 while receiving rtty - presumably from CLP-1. CLP45 Luanda then joined the fun, coming in CW on nearly same freq as CLP-18 and calling both CLP18 and CLP-1.
11438.3	FUM(?) Papeete	50/425r; ADN Nx GG for embassies can now be enjoyed at 1845. This is a very active station. Why not listed in a leading callbook?	19405.0	C?? Santiago	ARQ; Interpol msgs SS to Paris 1420
11448.1	Y7A48 Berlin	75/540n; long 5L code msgs, one headed "Salisyev" Off 1300.	19515.5	CLP-45 Luanda	75/500n; SS to CLP-1. Asks that he monitor 18400 and then 20970 for test. At 1900. 19515.5 new channel.
11464.0	HMF57(?) Pyongyang	50/425r; PAP Nx Polish 1222	20030.1	CLP1 Havana	50/425n; msgs SS to Embacuba Zambia, some encrypted 1440.
11494.0	SOL249 Warsaw	75/850r; ry 0110. New frequency for this fellow and quite strong here. What a wallop!	20420.1	CLP1 Havana	75/520n; Encrypted circulars to Embacubas 1615-1705
11500.3	PWZ33 Rio	50/425n; BTA ry then Nx EE starts 1330.	20560.1	5AQ88 Tripoli	50/425r; JANA Nx EE which includes vicious diatribe against U.S. 1645. (Thanks to JK for callsign)
11502.1	LZH-4 Sofia	50/1000; n meteo - wx msgs, WMO format, from RUHB, Khabarovsk Meteo Centre. 1313. Also at 0200.	20834.7	CLP-7 Brazzaville	50/500n msgs SS from Embacuba Congo to MINREX, Havana 1745
11520.4	RCR77 Khabarovsk	50/850n; A.P. Nx for Virginia and Washington DC happenings 1111	22566.5	CBV Valparaiso	ARQ msg to ship CBRM, 1730. Long scheduled, CBV is now active on this frequency and is received well here.
11529.3	N??	Changed to 50/250n for KCNA and JAPA Nx EE 0920 from HMF49.	22588.0	WLO Mobile	FEC Pacific Ocean Wx forecast relayed from KSFO, National Weather Service, San Francisco, 1745. Then Synopsis. At 1753 Atlantic Weather Forecast, relayed from National Weather Service, KWBC, Washington DC, followed by traffic list for WLO.
11536.0	HMF56 or 49 Pyongyang	50/290r; ry then 5-digit code groups to embassies in Berlin, Praga, Sofi and Bucharest 1010.	24109.9	AYA29 Buenos Aires,	Calling Interpol FSB, Paris at 1705. Strong signal - the 11-year cycle is on the "getting better" side now. About time!
11536.6	? ?	75/850r; ry. "Teutin de K7MVVVXD" repeated many times, 1600. At 1615 a slight change was made in callsign. It now became K7MVVVD, omitting the X. This was again repeated many times. At 1820 found him still on, the callsign now even shorter "Teutin de K7MVVVD."			
11570.2	K7MVVVXD	50/850r; fox, count 2222			
11603.3	GYU Gibraltar	50/425r; XINHUA Nx EE tuned in at 1505, poor reception but good enough to identify. Reception kept getting better and peaked at 1546. Faded out at about 1610.			
11605.9	BZS21 Yuryumqi				

# frequency SECTION

## LEGEND:

- \* The first four digits of an entry are the broadcast start time in UTC.
- \* The second four digits represent the end time.
- \* In the space between the end time and the station name is the broadcast schedule.
- S=Sunday M=Monday T=Tuesday W=Wednesday  
H=Thursday F=Friday A=Saturday

If there is no entry, the broadcasts are heard daily. If, for example, there is an entry of "M," the broadcast would be heard only on Mondays. An entry of "M,W,F" would mean Mondays, Wednesdays and Fridays only. "M-F" would mean Mondays through Fridays. "TEN" indicates a tentative schedule and "TES" a test transmission.

- \* The last entry on a line is the frequency. Codes here include "SSB" which indicates a Single Sideband transmission, and "v" for a frequency that varies.
- \* Frequencies in bold are most likely to be heard regularly in North America.

We suggest that you begin with the lower frequencies that a station is broadcasting on and work your way up the dial. Remember that there is no guarantee that a station will be audible on any given day. Reception conditions can change rapidly, though, and if it is not audible one night, it may well be on another.

Frequency updates from readers are also welcome and should be sent to:

Larry Miller, Frequency Coordinator  
Monitoring Times  
P.O. Box 691  
Thorndale, PA 19372

Anyone whose material is used will receive a certificate of appreciation from Monitoring Times. All frequencies on this list in bold have been heard by one or more MT monitors during the previous month.

0030-0100	W,A	Radio Budapest Hungary.....	6025, 6110
			9520, 9835
0030-0100	S,M	Radio Canada International	<b>5960, 9755</b>
0030-0100	T-A	Radio Portugal.....	<b>9680</b>
0030-0100		SLBC, Sri Lanka.....	6005, 9720
			15425
0045-0100	M	Radio Cultural, Guatemala...	3300, <b>5955</b>
0045-0100		Radio Korea World News Svc..	7275
0050-0100		Vatican Radio.....	<b>6030, 9605</b>
			<b>11780</b>

0100-0200		Voice of Indonesia.....	<b>9815, 115</b>
			<b>11740, 152</b>
0100-0200v	T-A	Voice of Nicaragua.....	6015v
0100-0200		WCSN, Boston, Mass.....	7365
0100-0200		WHRI, Indiana.....	<b>9852.5</b>
0100-0200		WINB, Pennsylvania.....	15145
0100-0200		WRNO Worldwide.....	<b>7355</b>
0100-0200		WYFR, Florida.....	<b>9680, 118</b>
0115-0200		Radio Berlin International..	6080, 97
0130-0200		KNLS, Alaska.....	<b>11905</b>
0130-0140		Voice of Greece.....	<b>7430, 98</b>
			<b>9420</b>
0130-0200		HCJB, Ecuador.....	<b>9870, 151</b>
0130-0200		Radio Austria International.	<b>9550</b>
0130-0200		Radio Veritas Asia, Philipp..	15135, 153
0145-0200		WINB, Pennsylvania.....	15145
		Radio Berlin International..	6125, 61

0000 UTC	[8:00 PM EDT/5:00 PM PDT]
0000-0015	Voice of People of Kampuchea 9693, 11938
0000-0025	Kol Israel..... <b>9435, 9855</b>
	<b>11610</b>
0000-0030	BBC, England..... <b>5975, 6005</b>
	<b>6120, 6175</b>
	<b>7325, 9515</b>
	<b>9590, 9915</b>
	<b>12095</b>
0000-0030	KGEI, California..... 15280
0000-0030	Radio Berlin International.. <b>6080, 9730</b>
0000-0030	Radio Canada International.. <b>5960, 9755</b>
0000-0030 M	Radio Norway International.. <b>9580, 9605</b>
0000-0045	WYFR, Florida..... <b>9680, 11855</b>
0000-0050	Radio Pyongyang, North Korea 15140, 15160
0000-0100	Armed Forces Radio and TV.. <b>6030, 15345</b>
0000-0100	All India Radio..... 9910, 11715
0000-0100	CBC Northern Quebec Svc... <b>6195, 9625</b>
0000-0100	CFCX, Montreal, Canada..... 6005
0000-0100	CFRX, Toronto, Canada..... 6070
0000-0100	CFVP, Calgary, Canada..... 6030
0000-0100	CHNX, Halifax, Canada..... 6130
0000-0100	CKFX, Vancouver, Canada..... 6080
0000-0100	KCBI, Texas..... 11910
0000-0100	KSDA, Guam (AWR)..... 15115
0000-0100	KVOH, California..... <b>17775</b>
0000-0100	KYOI, Saipan..... 15405
0000-0100	Radio Australia..... 15160, <b>15240</b>
	<b>15320, 15395</b>
	<b>15140, 17750</b>
	<b>17795</b>
0000-0100	Radio Baghdad, Iraq..... <b>11705</b>
0000-0100	Radio Beijing, China..... 9550
0000-0100	Radio Discovery, Domin. Rep. 15045
0000-0100v	Radio Dublin International.. 6910
0000-0100	Radio Havana Cuba..... <b>6090, 9655</b>
0000-0100	Radio Moscow..... <b>9530, 9600</b>
	<b>9685, 9700</b>
	<b>9720, 9765</b>
	<b>9865, 11710</b>
	<b>11750, 12060</b>
0000-0100	Radio Thailand..... 9650, 9665
0000-0100	Radio Veritas, Philippines.. 11905
0000-0100	Radio New Zealand Int'l.... 9740
	11780, 15150
	17705
0000-0100	RTL Luxembourg..... <b>6090</b>
0000-0100	Spanish Foreign Radio, Spain <b>9630, 11880</b>
0000-0100	Voice of America..... <b>5995, 9655</b>
	<b>6130, 9455</b>
	<b>9650, 9775</b>
	<b>9815, 11580</b>
	<b>11695, 11740</b>
	<b>15205</b>
0000-0100v	Voice of Nicaragua..... 6015
0000-0100	WCSN, Boston, MA..... <b>7365</b>
0000-0100	WINB, Pennsylvania..... 15145
0000-0100	WHRI, Indiana..... <b>11770</b>
0000-0100	WRNO Worldwide..... <b>7355</b>
0015-0100	AWR, Costa Rica..... 15460
0030-0100	BBC, England..... <b>5975, 6005</b>
	<b>6075, 6120</b>
	<b>6175, 7325</b>
	<b>9515, 9590</b>
	<b>9915, 12095</b>
	<b>9870, 11910</b>
0030-0100	HCJB, Ecuador..... <b>15155</b>
0030-0100 A	KTWR, Guam..... 15340
0030-0100	Radio Belize..... 3285

0100 UTC	[9:00 PM EDT/6:00 PM PDT]
0100-0115	All India Radio..... 6035, 7215
	9595
0100-0115	Vatican Radio..... 6030, 9605
	11780, 11900
0100-0120	RAI, Italy..... 9575, 11800
0100-0124	Kol Israel..... <b>9435, 9855</b>
	<b>11610, 11910</b>
0100-0130	HCJB, Ecuador..... <b>9870, 11775</b>
	<b>11910, 15155</b>
0100-0130 T-A	Radio Budapest, Hungary..... 6025, 9520
	9585, 9835
0100-0130	Radio Japan General Service <b>15280, 17845</b>
0100-0130	Radio Vientiane, Laos..... 7112v
0100-0130	WINB, Pennsylvania..... 15145
0100-0145	Radio Baghdad, Iraq..... <b>11705</b>
0100-0145	Radio New Zealand Int'l.... 15150, 17705
0100-0150	Deutsche Welle, West Germany <b>6040, 6085</b>
	<b>6145, 9545</b>
	<b>9565, 9605</b>
0100-0200	ABC, Perth, Australia..... 15425
0100-0200	Armed Forces Radio and TV.. <b>6030, 15345</b>
0100-0200	BBC, England..... <b>5975, 6005</b>
	<b>6120, 6175</b>
	<b>7325, 9515</b>
	<b>9590, 9915</b>
0100-0200	CBC Northern Quebec Svc... 6195, 9625
	11920
0100-0200	CFCX, Montreal, Canada..... 6005
0100-0200	CFRX, Toronto, Canada..... 6070
0100-0200	CFVP, Calgary, Canada..... 6030
0100-0200	CHNX, Halifax, Canada..... 6130
0100-0200	CKFX, Vancouver, Canada..... 6080
0100-0200	FEBC, Manila, Philippines.. 15315, 21475
0100-0200	KCBI, Texas..... 11910
0100-0200	KSDA, Guam (AWR)..... 15115
0100-0200	KVOH, California..... <b>9495</b>
0100-0200	KYOI, Saipan..... 15405
0100-0200	Radio Australia..... <b>15160, 15180</b>
	<b>15240, 15320</b>
	<b>15395, 17715</b>
	<b>17750, 17795</b>
0100-0200	Radio Belize..... 3285
0100-0200	Radio Canada International.. <b>5960, 9755</b>
	<b>11845, 11940</b>
0100-0200 M	Radio Cultural, Guatemala... 5955
0100-0200v	Radio Dublin International.. 6910
0100-0200	Radio Havana Cuba..... <b>6090, 9655</b>
0100-0200	Radio Korea, South..... <b>15575</b>
0100-0200	Radio Moscow..... <b>7165</b>
	<b>9600, 9685</b>
	<b>9700, 9720</b>
	<b>9765, 9865</b>
	<b>11710, 11750</b>
	<b>12060</b>
0100-0200	Radio Moscow World Service. 17850, 17880
	11720, 11845
0100-0200	Radio Prague, Czechoslovakia 5930, 6055
	<b>7345, 9540</b>
	<b>11990</b>
0100-0200	Radio Thailand..... <b>9665, 11905</b>
0100-0200v	RAE, Argentina..... 9690, 11710
0100-0200	SBC Radio 1, Singapore.... 11940
0100-0200	Spanish Foreign Radio, Spain <b>9630, 11880</b>
0100-0200	Sri Lanka Broadcasting Corp. 6005, 9720
	15425
0100-0200	Voice of America..... 5995, 6130
	<b>7205, 9455</b>
	<b>9650, 9775</b>

0200 UTC	[10:00 PM EDT/7:00 PM PDT]
0200-0210	Radio France Int'l..... 5950, 61
	9715, 97
0200-0215	Radio Budapest, Hungary.... 6025, 95
	9585, 98
0200-0230	BBC, England..... <b>5975, 60</b>
	<b>6120, 61</b>
	<b>7325, 94</b>
	<b>9515, 98</b>
	<b>9915</b>
0200-0230	Burma Broadcasting Corp.... 7185
0200-0230 S,M	WINB, Pennsylvania..... <b>15145</b>
0200-0230 S	Radio Austria Int'l..... 9550
0200-0230	Radio Berlin International.. <b>6125, 61</b>
0200-0245	Radio Berlin International.. 9560, 98
0200-0230 M-F	Radio Canada International.. <b>5960, 97</b>
0200-0230	Radio Kiev, Ukraine SSR.... <b>7260, 98</b>
	<b>9800, 11</b>
	<b>11875, 13</b>
0200-0230	Swiss Radio International... <b>6135, 97</b>
	<b>9885, 12</b>
0200-0230 T-A	Voice of Nicaragua..... 6015
0200-0250	Deutsche Welle, W. Germany.. 6035, 7
	9650, 98
	11945
0200-0256	Radio RSA, South Africa.... <b>6010, 97</b>
	<b>9720</b>
0200-0300	ABC Perth, Australia..... 15425
0200-0300	Armed Forces Radio and TV... <b>6030, 15</b>
0200-0300	CBC Northern Quebec Service. 6195, 9
0200-0300	GBC, Guyana..... 5950
0200-0300	HCJB, Ecuador..... <b>9870, 11</b>
0200-0300	KSDA, Guam (AWR)..... 15115
0200-0300	KVOH, California..... 9495
0200-0300	KYOI, Saipan..... 15405
0200-0300	Radio Australia..... 15240, 15
	<b>17705, 17</b>
	<b>17795</b>
0200-0300	Radio Belize..... 3285
0200-0300	Radio Bras, Brazil..... <b>11745</b>
0200-0300	Radio Bucharest, Romania.... 5990, 9
	<b>9570, 11</b>
0200-0300	Radio Cairo, Egypt..... <b>9475, 9</b>
0200-0300 T-A	Radio Canada International.. <b>5960, 9</b>
0200-0300 T-S	Radio Dublin International.. 6910
0200-0300	Radio Havana Cuba..... <b>6090, 6</b>
	<b>9655</b>
0200-0300	Radio Japan..... 11870, 15
	15195, 17
0200-0300	Radio Moscow, U.S.S.R..... <b>7165, 9</b>
	<b>9685, 9</b>
	<b>9700, 9</b>
	<b>11710, 11</b>
	<b>11845, 12</b>
	<b>12050, 15</b>
0200-0300	Radio Moscow World Service <b>17850, 17</b>
	<b>17880</b>
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		6195, 7185			9560, 9620			9600
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		15345, 21570	0400-0430	Radio Bucharest, Romania...	5990, 9510	0500-0600	CFCX, Montreal, Canada.....	6005
0300-0400	CFCX, Montreal, Canada.....	6005			9570, 11810	0500-0600	CFRX, Toronto, Canada.....	6070
0300-0400	CFRX, Toronto, Canada.....	6070			11940	0500-0600	CFVP, Calgary, Canada.....	6030
0300-0400	CFVP, Calgary, Canada.....	6030			6120, 11715	0500-0600	CHNX, Halifax, Canada.....	6130
0300-0400	CHNX, Halifax, Canada.....	6130			11755	0500-0600	CKFX, Vancouver, Canada....	6080
0300-0400	CKFX, Vancouver, Canada....	6080			9650, 11735	0500-0600	HCJB, Quito, Ecuador.....	6230, 9870
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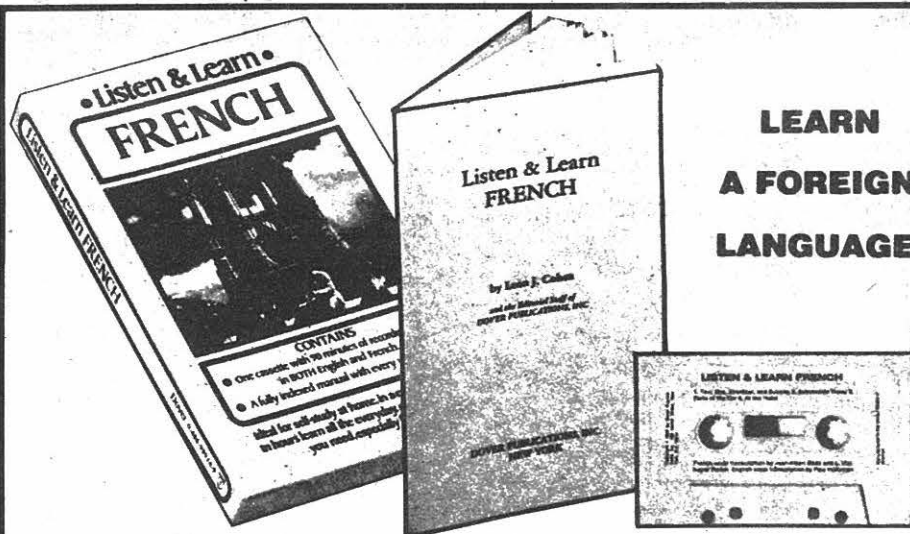
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 9610, 11730  
 11850, 11935  
 9510, 9600  
 9600, 9640  
 11860  
 11330  
 11715

0730-0800 BBC, London..... 11860  
 11330  
 11715

0730-0800 S CPBS, China..... 5995, 9655  
 0735-0800 M-H KTWG, Guam..... 11720, 15240  
 15395, 17715  
 17750

0730-0800 Radio Netherlands..... 9630, 9715  
 0730-0800 Swiss Radio Int'l..... 3985, 6165  
 9535

## 0800 UTC [4:00 AM EDT/1:00 AM PDT]

0800-0805 GBC, Accra, Ghana..... 3366  
 0800-0825 M-F BRT, Belgium..... 9880, 15515  
 0800-0825 Radio Netherlands..... 9630, 9715  
 0800-0825 Voice of Malaysia..... 6175, 9750  
 15295

0800-0830 Voice of Islam, Bangladesh.. 12030, 15525  
 0800-0830 HCJB, Quito, Ecuador..... 6130, 6205  
 9745, 9860

0800-0845 S FEBA, Seychelles..... 15120, 17795  
 0800-0900 AFAN, Antarctica..... 6012  
 0800-0900 AFRTS Far East Network.... 11750  
 0800-0900 BBC, London..... 5975, 7150  
 9600, 9640

0800-0900 S BBS, Bhutan..... 6035  
 0800-0900 CFCX, Montreal, Canada.... 6005  
 0800-0900 CFRX, Toronto, Canada..... 6070  
 0800-0900 CFVP, Calgary, Canada..... 6030  
 0800-0900 CHNX, Halifax, Canada..... 6130  
 0800-0900 CKFX, Vancouver, Canada.... 6080  
 0800-0900 FEBC, Manila..... 6030, 11890  
 21475

0800-0900 FEN, Tokyo..... 3910, 6150  
 0800-0900 S,A GBC-2, Accra, Ghana..... 3366  
 0800-0900 HCJB, Quito, Ecuador..... 6130, 9745  
 0800-0900 King of Hope, Lebanon..... 6280  
 0800-0900 KNLS, Anchor Point, Alaska. 5960  
 0800-0900 M-H KTWG, Guam..... 11715  
 0800-0900 KYOI, Saipan..... 15190  
 0800-0900 Radio Australia..... 9580, 9650  
 11720, 15390  
 17715, 17750

0800-0900 Radio Korea World News Svc.. 7275  
 0800-0900 Radio Kuwait..... 9750  
 0800-0900 Radio Moscow..... 9795  
 0800-0900 S Radio Prague..... 6055, 9505  
 11990

0800-0900 Radio Pyongyang, N. Korea.. 9530, 13680  
 11830, 15160  
 15180

0800-0900 RTE Portugal..... 9670  
 0800-0900 SBC Radio 1, Singapore..... 5010, 11940  
 0800-0900 TWR Monte Carlo..... 7105  
 0800-0900 Voice of Indonesia..... 11790, 15150  
 0800-0900 Voice of Nigeria..... 7255, 15180  
 0800-0900 WHRI, Indiana..... 7355  
 0800-0900 S WRNO Worldwide..... 6185  
 0800-0900 WSZO, Marsall Island..... 4970  
 0830-0840 All India Radio..... 5960, 5970  
 5990, 6010  
 6020, 6050  
 6100, 7110  
 7125

0830-0840 Voice of America, Washington 7175, 9570  
 9750

0830-0855 Radio Finland, Helsinki.... 6120, 15240  
 0830-0855 M-A Radio Netherlands..... 9630  
 0830-0900 Radio Austria Int'l..... 7210, 11840  
 0830-0900 Radio Beijing..... 9700, 11750  
 15440

0830-0900 Radio Prague, Czechoslovakia 11855, 17840  
 21705

0830-0900 HCJB, Quito, Ecuador..... 6130, 9740  
 11925

0830-0900 Radio Netherlands..... 17575, 21480  
 0830-0900 Swiss Radio International... 9560, 9880  
 11905, 15570

0847-0852 A R. Pacific Ocean, Vladivost. 9500, 9620  
 9635, 9790  
 9810, 11710  
 11815, 11910  
 12010, 15260  
 15295, 17760  
 17815, 17850

## 0900 UTC [5:00 AM EDT/2:00 AM PDT]

0900-0905 Africa Number One, Gabon... 7200, 1520  
 0900-0915 BBC, London..... 5975, 6040  
 7150, 9410  
 11750

0900-0925 Radio Netherlands..... 17575, 2148  
 1000-1030 Kol Israel..... 11700, 1372  
 15640, 1565  
 17565, 1768  
 17815

0900-0930 Radio Australia..... 9580, 965  
 9710, 1172  
 15415

0900-0930 Radio Korea..... 7275  
 0900-0950 Radio Pyongyang N. Korea... 9765, 1183  
 13650

0900-1000 ABC, Brisbane, Australia... 4920, 966  
 0900-1000 S Adventist World Radio..... 9670

0900-1000 AFRTS..... 6030, 953  
 0900-1000 Deutsche Welle..... 6160, 968  
 11890, 2147

0900-1000 FEBC, Manila..... 6155  
 0900-1000 FEN, Tokyo..... 6130, 974  
 0900-1000 HCJB, Quito, Ecuador..... 6280  
 0900-1000 King of Hope, Lebanon..... 5960  
 0900-1000 KNLS, Alaska..... 5960  
 0900-1000 KSDA, Guam..... 15440  
 0900-1000 Radio Afghanistan..... 6085, 958  
 15255, 1765

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0900-1000	Radio Japan.....	9675, 11875 11955, 15235 17810	1030-1100	UAE Radio, Dubai.....	15435, 17775 17865, 21605	1130-1200	Radio Thailand.....	9655, 11905
0900-1000	Radio Moscow.....	9600, 9795 13645, 13665 13680, 13705 15110, 15140 15155, 15225 15265, 15490 17625, 17645 17665, 17775	1040-1050	Vatican Radio.....	6250, 9645 11740	1130-1200	TWR Bonaire.....	11815
0900-1000	Radio New Zealand Int'l.....	9600, 11780	1040-1050	Voice of Greece.....	15630, 17565	1130-1200	WYFR, Florida.....	9680
0900-1000	Radio Tanzania.....	9685v	1045-1000	Radio Nepal.....	5005, 9590	1145-1200	Radio Berlin Intl.....	15240
0900-1000 S	Radio Prague.....	6055, 9505 11990	1050-1100 M-F	Radio Budapest Hungary.....	6025, 7225 9835, 11910 17710			
0900-1000	SBC Radio 1, Singapore.....	5010, 11940						
0900-1000	TWR Monte Carlo.....	7105						
0900-1000	Voice of Nigeria.....	15120, 15185 17800						
0900-1000	WHRI, Indiana.....	7355						
0900-1000	WRNO Worldwide.....	6185						
0900-1000	WSZO, Marsall Island.....	4970						
0915-1000	BBC, London.....	9760, 9750 11750						
0930-1000	Radio Australia.....	9580, 9655 9710						
0930-1000	Radio Budapest Hungary.....	9835, 11910 15160, 15220 17710, 21665						
0950-1000 M-F	Radio Budapest Hungary.....	9585, 9835 11910, 15160 17710						
1000 UTC	[6:00 AM EDT/3:00 AM PDT]		1100 UTC	[7:00 AM EDT/4:00 AM PDT]		1200 UTC	[8:00 AM EDT/5:00 AM PDT]	
1000-1010	Voice of Kenya.....	9665	1100-1115	Radio Pakistan.....	15605, 17660	1200-1210	Voice of Is.Rep.of Iran....	11790, 15084
1000-1025 M-A	BRT, Belgium.....	15515, 17595	1100-1120	Radio Budapest, Hungary....	6025, 6175 7225, 9790 9805, 9835 11910, 15365 15425, 17710 17720, 17850 21620	1200-1215	Radio New Zealand.....	6100, 9620
1000-1030	Afghanistan.....	6085, 9590 15255, 17655 7225, 9735	1100-1120	Radio France Int'l, Paris..	11670, 11845 15195, 15300 15315, 15365 17620	1200-1215 M-A	Vatican Radio.....	15190, 17840 17865, 21485
1000-1030	Deutsche Welle, W. Germany..	17765, 21600 11585, 11605 15095, 15640 15650, 17630 17815	1100-1125	Radio Netherland.....	6020, 9650	1200-1215 S	Voice of People of Kampuchea	9693, 11938
1000-1030	Kol Israel.....	15095, 15640 15650, 17630 17815	1100-1130	Radio Australia.....	5995, 6080 7215, 9580 9645, 9710 9770, 11705 11800	1200-1225	Radio Bucharest, Romania....	9530, 11740
1000-1030	Radio Australia.....	9580, 9655 15415	1100-1130 M-A	Radio Finland.....	11945, 15400	1200-1225	Radio Netherland.....	5955, 9715 15560, 17575 17605, 21480
1000-1030 S	Radio Norway International.	11870, 15175 15230	1100-1130	Radio Japan General Service.	5990, 6120 17810	1200-1225	Radio Polonia.....	6095, 7285
1000-1030	Swiss Radio Int'l.....	9560, 9885 11905, 15570 9755, 9765	1100-1130	Radio Maputo, Mozambique....	9525, 11815	1200-1230	HCJB, Quito, Ecuador.....	6075, 11740
1000-1030	Voice of Vietnam.....	12035 6030, 6125 9530, 9590 9700, 11805	1100-1130	Sri Lanka Broadcasting Corp	11835, 15120 17850	1200-1230	Radio Australia.....	5995, 6060 6080, 7205 7215, 9580 9710, 9770 11800
1000-1100	AFRTS.....	6030, 6125 9530, 9590 9700, 11805	1100-1130	Swiss Radio International..	9665, 9870 11795, 15570	1200-1230 M-A	Radio Berlin Intl.....	15240
1000-1100	All India Radio.....	11705, 11810 15320, 15335 17387, 17875	1100-1130	Voice of America.....	6110, 9760 15160, 15210 15425 9755, 9765 12035	1200-1230	Radio Finland.....	11945, 15400
1000-1100	BBC, London.....	6195, 9410 9740, 9750 9760, 11750 12095, 15070 15280, 15400 21660	1100-1156	Voice of Vietnam.....	9755, 9765 12035	1200-1230	Radio Tashkent.....	7325, 9600 9715, 15460 3905, 4800 4920, 7280 9565, 9615 11620, 15245
1000-1100	B.S. Kingdom Saudi Arabia..	11855v	1100-1200	Radio RSA, South Africa....	11900, 15220 17780	1200-1235	All India Radio.....	3905, 4800 4920, 7280 9565, 9615 11620, 15245
1000-1100	CFCX, Montreal, Canada.....	6005	1100-1200	4VEH, Haiti.....	4930	1200-1235	Radio Ulan Bator Mongolia..	12015
1000-1100	CFRX, Toronto, Canada.....	6070	1100-1200	ABC, Brisbane, Australia....	4920	1200-1242	Trans World Radio Bonaire..	11815
1000-1100	CFVP, Calgary, Canada.....	6030	1100-1200	ABC, Perth, Australia.....	9610 6030, 9590 9700, 15430 5965, 6195 9510, 11775 12095, 15070 17790	1200-1250	Radio Pyongyang, N. Korea..	9715
1000-1100	CHNX, Halifax, Canada.....	6130	1100-1200	AFRTS.....	9610, 9760 15160, 15210 15425 9755, 9765 12035	1200-1300	4VEH, Haiti.....	4930
1000-1100	CKFX, Vancouver, Canada....	6080	1100-1200	BBC, London.....	9510, 11775 12095, 15070 17790	1200-1300	ABC, Wanneroo, Australia....	6140, 9610
1000-1100	FEN, Japan.....	3910, 6155	1100-1200	B.S. Kingdom Saudi Arabia..	11855v	1200-1300	ABC, Brisbane.....	4920
1000-1100	HCJB, Quito, Ecuador.....	6130, 9745	1100-1200	CFCX, Montreal, Canada.....	6005	1200-1300	AFRTS.....	6030, 6125 9700, 15330 15430, 21670
1000-1100	KNLS, Alaska.....	11930	1100-1200	CFRX, Toronto, Canada.....	6070	1200-1300	BBC, London.....	5965, 6195 9510, 9740 9750, 11710 11750, 11775 12095, 15070 17790, 17705 21710
1000-1100	Radio Dubai, UAE.....	17775	1100-1200	CFVP, Calgary, Canada.....	6030	1200-1300	B.S. Kingdom Saudi Arabia..	11855v
1000-1100	Radio Honaire, Soloman IIs..	5020	1100-1200	CHNX, Halifax, Canada.....	6130	1200-1300	CBC Northern Quebec Service.	9625
1000-1100	Radio Moscow.....	6000, 7390 11950, 15375	1100-1200	CKFX, Vancouver, Canada....	6080	1200-1300	CFCX, Montreal, Canada.....	6005
1000-1100 S	Radio New Zealand Int'l.....	9600, 11780	1100-1200	FEN, Tokyo.....	3910, 6155	1200-1300	CFRX, Toronto, Canada.....	6070
1000-1100 S	Radio Prague.....	6055, 9505 11990	1100-1200	GBC, Accra, Ghana.....	7295	1200-1300	CFVP, Calgary, Canada.....	6030
1000-1100	SBC Radio 1, Singapore.....	5052, 11940	1100-1200	HCJB, Quito, Ecuador.....	11740, 11745 15115, 17890	1200-1300	CHNX, Halifax, Canada.....	6130
1000-1100	Voice of Nigeria.....	7255, 15120	1100-1200	KYOI, Saipan.....	11900	1200-1300	CKFX, Vancouver, Canada....	6080
1000-1100	WCSN, Massachusetts.....	17640	1100-1200	Radio Beijing.....	9535	1200-1300	FEN, Tokyo.....	3910, 6155
1000-1100	WHRI, Indiana.....	7355	1100-1200	Radio Korea.....	7275, 15575	1200-1300	GBC, Accra, Ghana.....	7295
1000-1100 S	WRNO Worldwide.....	6185	1100-1200	Radio Malaysia, Sarawak....	4950	1200-1300	HCJB, Quito, Ecuador.....	11740, 11745 15115, 17890
1005-1010	Radio Pakistan.....	15605, 17660	1100-1200	Radio Moscow.....	6000, 11950 13710, 15375 15595	1200-1300	KYOI, Saipan.....	11900
1030-1040	Voice of Asia, Taiwan.....	5980	1100-1200	Radio New Zealand.....	6100, 9600	1200-1300	Pt Moresby, Papua New Guinea	4890
1030-1100	Radio Austria International.	9625, 9770 12025, 15270 15415	1100-1200	Radio Pyongyang, N. Korea..	7300, 9750 9977	1200-1300	Radio Beijing.....	9535, 9645
1030-1100	Radio Australia.....	9580	1100-1200	SBC Radio 1, Singapore.....	5052, 11940	1200-1300 S	Radio Moscow.....	6000, 13680 13710, 15360 15375, 15490 15530, 15540 17645
1030-1100	Radio Netherland.....	6020, 9650	1100-1200	Trans World Radio Bonaire..	11815	1200-1300	Radio Tanzania.....	9685
1030-1100	Radio New Zealand.....	6100, 9620	1100-1200	Voice of Asia, Taiwan.....	5980, 7445	1200-1300	RAE, Argentina.....	15345
1030-1100	Sri Lanka Broadcasting Corp	11835, 15120 17850	1100-1200	Voice of Nigeria.....	7255, 15120	1200-1300	SBC Radio 1, Singapore.....	5010, 5052 11940
			1100-1200	WCSN, Massachusetts.....	17640	1200-1300	Voice of America.....	9760 11715, 15425 15430, 17790
			1100-1200	WHRI, Indiana.....	5995	1200-1300		
			1100-1200	WRNO Worldwide.....	9715	1200-1300	WHRI, Indiana.....	5995
			1100-1200	WYFR, Florida.....	5985, 9680 11875	1200-1300 S	WRNO Worldwide.....	9715
			1115-1200	Radio Berlin International.	21465, 21540	1200-1300	WYFR, USA.....	6105, 9680
			1115-1130	Vatican Radio.....	17840, 21485	1200-1300		11830, 11875 15170
			1115-1200	Voice of Islamic Rep. Iran.	11790	1210-1300	Voice of Nigeria.....	7255, 15120
			1130-1200	Radio Australia.....	5995, 6060 6080, 7215 9580, 9645 9710, 9770 11800	1215-1300	Radio Cairo.....	17675
				R. Berlin Intl, E. Germany	15240	1215-1245	Radio Japan Regional Serv..	11875, 15300
				Radio Japan.....	5990, 6120	1215-1230	Voice of Islamic Rep. Iran.	11895, 15085
				Radio Netherland.....	5955, 9715 15560, 17575 17605, 21480	1230-1300	Radio Austria International	15320
						1230-1300	Radio Australia.....	5995, 6060 6080, 7205 7215, 9580 9770
						1230-1300	Radio Bangladesh.....	15525, 12030
						1230-1300	Radio Berlin Int'l.....	21465
						1230-1300	Radio Jordan.....	9560
						1230-1300	Radio Polonia.....	15190, 15430
						1230-1300	Radio Sweden Int'l.....	9565, 11735
						1230-1300	TES Radio Veritas, Philippons.	6160

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1230-1300	Sri Lanka Broadcasting Corp.	6075, 9720
1230-1300	Voice of Turkey.....	15425
1230-1300	WYFR, Florida.....	15255
1235-1245	Voice of Greece.....	15055
		11645, 15360
1255-1300 M-A	Radio Ulan Bator Mongolia...	15630, 17565
		7235, 9575
1255-1300	TWR, Sri Lanka.....	15305
1255-1330 A-S	TWR, Bonaire.....	11825
		11815

## 1300 UTC [9:00 AM EDT/6:00 AM PDT]

1300-1315	Radio Berlin International.	21465
1300-1330	BBC, London.....	9510, 11775
		15070, 17705
		17780, 17790
1300-1330	Radio Australia.....	5995, 6060
		6080, 7205
		9580
1300-1330	Radio Bucharest, Romania...	11940, 15250
1300-1330	Radio Finland.....	15400, 11945
1300-1330 S	Radio Norway International.	15310, 17760
1300-1330	Swiss Radio Int'l, Berne...	15570, 17830
1300-1337 A-S	TWR, Bonaire.....	11815
1300-1330 S	WRNO, Worldwide.....	9715
1300-1350	Radio Pyongyang, N. Korea...	9345, 11665
1330-1355 S	Radio Finland.....	11945, 15400
1300-1400	4VEH, Haiti.....	4930
1300-1400	ABC Waneroo, Australia.....	6140, 9610
1300-1400	AFRTS.....	9700, 15430
1300-1400	B.S. Kingdom Saudi Arabia...	11855v
1300-1400	CFCX, Montreal, Canada.....	6005
1300-1400	CFRX, Toronto, Canada.....	6070
1300-1400	CFVP, Calgary, Canada.....	6030
1300-1400	CHNX, Halifax, Canada.....	6130
1300-1400	CKFX, Vancouver, Canada.....	6080
1300-1400	CKZU, Vancouver, Canada.....	6160
1300-1400	FEBC, Manila.....	11850
1300-1400	FEN, Tokyo.....	6155
1300-1400	GBC, Accra, Ghana.....	7295
1300-1400	HCB, Quito, Ecuador.....	11740, 15115
		17890
1300-1400	NBC, Port Moresby, Papua New Guinea.....	4890
1300-1400	Radio Beijing.....	9730
1300-1400 S	Radio Canada Int'l.....	11955, 15440
1300-1400	Radio Jordan.....	9560
1300-1400	Radio Korea.....	9570, 9750
1300-1400	Radio Moscow.....	11840, 15375
		15475, 15585
1300-1400	Radio RSA, South Africa....	15220, 21535
		21590
1300-1400	SBC Radio 1, Singapore.....	5010, 5052
		11940
1300-1400	Sri Lanka Broadcasting Corp.	6075, 9720
		15425
1300-1400	TWR, Sri Lanka.....	11825
1300-1400	Voice of America.....	6110, 7230
		9760, 11715
		11790
1300-1400	Voice of Nigeria.....	7255, 15120
1300-1400	WHRI, Indianapolis.....	11790
1300-1400	WYFR, USA.....	5985, 11830
		11875, 15055
1315-1400	Radio Berlin Int'l.....	11795, 15445
		17700
1330-1400	All India Radio.....	11810, 15335
1330-1400	Laotian National Radio.....	7113v
1330-1400	BBC, London.....	9750, 9760
		12095, 15070
		17885, 21710
1330-1400 M-A	BBS, Bhutan.....	6035
1330-1445	BBS, Burma.....	4725
1330-1355 M-A	BRT, Belgium.....	15515, 15590
1330-1400	Radio Australia.....	5995, 6060
		6080, 7135
		9580
1330-1400 M-A	Radio Budapest Hungary.....	9835, 11910
		15160, 15220
		17710, 21665
1330-1400 S	Radio Finland.....	11945, 15400
1330-1400	Radio Tashkent.....	7325, 9715
		15460
1330-1400	Radio Yugoslavia.....	9620, 15240
1330-1400	Swiss Radio International..	9730, 9885
		11905, 11955
		12030
1330-1400	U.A.E. Radio.....	15435, 17865
		21605
1330-1400	Voice of Vietnam.....	9755, 9840
		12020, 12035
1330-1400 S	WRNO, Worldwide.....	11965
1337-1400 A	TWR, Bonaire.....	11815
1345-1400	Vatican Radio.....	7250, 9645
		11740

## 1400 UTC [10:00 AM EDT/7:00 AM PDT]

1400-1415	GBC-2, Accra, Ghana.....	7295
1400-1430	Radio Australia.....	5995, 6080
		7135, 9580
1400-1430	Radio Finland.....	15400
1400-1430	Radio Japan General Service	11870
1400-1430 S	Radio Norway International.	15250, 15300
		15310
1400-1430	Radio Sweden International.	11785, 15345
1400-1500	AFRTS.....	9700, 11805
		15330, 15430
1400-1500	All India Radio.....	11810, 15335
1400-1500	BBC, London.....	12095, 15070
		15275, 17705
		17790, 17885
1400-1500	CBC Northern Quebec Service.	9625, 11720
1400-1500	CFCX, Montreal, Canada.....	6005
1400-1500	CFRX, Toronto, Canada.....	6070
1400-1500	CFVP, Calgary, Canada.....	6030
1400-1500	CHNX, Halifax, Canada.....	6130
1400-1500	CKFX, Vancouver, Canada.....	6080
1400-1500	FEBC, Manila.....	9665, 11815
		11850
1400-1500	HCJB, Quito, Ecuador.....	11740, 15115
		17890
1400-1500	Kuching, Sarawak, Malaysia	4950
1400-1500 S	Radio Canada International.	11720, 11955
		15440
1400-1500	Radio Jordan.....	9560
1400-1500	Radio Moscow.....	11840, 13680
		11950, 15375
1400-1500	Radio Pyongyang, N. Korea....	7300, 9555
		9750
1400-1500	Radio RSA, South Africa.....	21590
1400-1500	Radio Veritas, Philippines	6160
1400-1500	SBC Radio 1, Singapore.....	5010, 5052
		11940
1400-1500	Sri Lanka Broadcasting Corp.	6075, 9720
		15425
1400-1500	TWR, Sri Lanka.....	11825
1400-1500	Voice of America.....	6110, 7230
		9760, 11715
1400-1500	WHRI, Indiana.....	11790
1400-1500 S	WRNO Worldwide.....	11965
1415-1430 A,S	KTWR, Guam.....	9870
1415-1500	Radio Berlin Int'l.....	15240
1415-1430	Radio Nepal.....	5005
1415-1500 S,A	GBC-2, Accra, Ghana.....	3366
1430-1500	KTWR, Guam.....	9840
1430-1500	Radio Australia.....	5995, 6060
		6035, 6080
		7205, 9580
1430-1500 M-A	Radio Budapest Hungary.....	11910, 15055
		15220, 17710
		21525, 21665
1430-1500	Radio Korea, South.....	9750, 15575
1430-1500	Radio Netherland.....	5955, 11735
		13770, 15560
1430-1500	Radio Yugoslavia.....	9620, 15240
1430-1500	WYFR, USA.....	9535, 11830
		11875, 15055
1448-1455	Radio Vatican.....	15090
1445-1500	Radio Ulan Bator, Mongolia..	9575

## 1500 UTC [11:00 AM EDT/8:00 AM PDT]

1500-1505 M-F	Africa #1, Gabon.....	15200
1500-1520	Radio Ulan Bator Mongolia...	9615, 12015
1500-1525	TWR, Sri Lanka.....	11825
1500-1530	BBS, Burma.....	4725
1500-1530	HCJB, Quito, Ecuador.....	11740, 15115
		17890
1500-1530	Radio Berlin Int'l.....	15255
1500-1530	Radio Netherland.....	13770, 15560
1500-1530	Radio Veritas, Philippines..	9565, 15120
1500-1530	TWR, Guam.....	9870
1500-1530	Voice of Nigeria.....	7255, 11770
1500-1550	Deutsche Welle.....	15135, 17825
1500-1556	Radio RSA, South Africa....	17780, 21590
1500-1600	AFRTS.....	9700, 15330
1500-1600	BBC, London.....	12095, 15070
1500-1600	BBC, London.....	11775, 15260
1500-1600 A,S	CBC Northern Quebec Service.	9625, 11720
1500-1600	CFCX, Montreal, Canada.....	6005
1500-1600	CFRX, Toronto, Canada.....	6070
1500-1600	CFVP, Calgary, Canada.....	6030
1500-1600	CKFX, Vancouver, Canada.....	6080
1500-1600	CHNX, Halifax, Canada.....	6130
1500-1600	FEBC, Manila.....	9670, 11850
1500-1600	KTWR, Guam.....	9840
1500-1600	Radio Australia.....	5995, 6060
		6080, 6035
		7205, 7215
		9580

1500-1600 S	Radio Canada International.	9625, 11720
		11955, 15440
1500-1600	Radio Japan General Service.	9695, 21700
1500-1600	Radio Jordan.....	9560
1500-1600	Radio Moscow.....	11790, 11840
		11850, 11860
		11950, 13680
		15375
1500-1600	RTM, Sarawak, Malaysia.....	4950
1500-1600	SBC Radio 1, Singapore.....	5010, 5052
		11940
1500-1600	Sri Lanka Broadcasting Corp.	6075, 9720
		15425
1500-1600	Voice of America.....	15205
1500-1600	Voice of Nigeria.....	7255, 11770
1500-1600	Voice of Indonesia.....	11790, 15150
1500-1600	V. Revolutionary Ethiopia..	9560
1500-1600	WHRI, Indiana.....	15105
1500-1600	WRNO Worldwide.....	11965
1500-1600	WYFR, Florida.....	9535, 11550
		11830, 11875
		15170
1513-1600 F-S	FEBC, Seychelles.....	11820
1530-1600	KNLS, Alaska.....	7355
1530-1545	Radio Bangladesh.....	7195
1530-1600	R. Prague, Czechoslovakia..	9735, 11690
		11990, 13715
		17705, 17840
		21505
1530-1600	Swiss Radio International..	9735, 11690
		15430
1530-1600	Voice of Asia, Taiwan.....	5980, 7445
1540-1550	Voice of Greece.....	11645, 15630
		17565
1545-1600	Vatican Radio.....	11810, 15090
		17730

## 1600 UTC [12:00 PM EDT/9:00 AM PDT]

1600-1605	SBC Radio 1, Singapore.....	11940
1600-1615	Radio Pakistan.....	9645, 11615
		11675, 11735
		11925, 15515
		15595, 17660
1600-1630 S	Radio Norway International.	15180, 17840
1600-1630 M-F	Radio Portugal.....	15105
1600-1630	Radio Sweden Int'l.....	15110
1600-1630	Voice of Vietnam.....	9755, 9840
		12020, 12035
1600-1640	UAE Radio.....	9640, 11730
		15320, 17770
1600-1645	TWR, Swaziland.....	3200
1600-1700	AFRTS.....	9700, 15330
		15430
1600-1700	BBC, London.....	11775, 12095
		15070, 15260
		15400, 17890
1600-1700 A	CBC Northern Quebec Service.	9625, 11720
1600-1700	CFCX, Montreal, Canada.....	6005
1600-1700	CHNX, Halifax, Canada.....	6130
1600-1700	CFRX, Toronto, Canada.....	6070
1600-1700	CFVP, Calgary, Canada.....	6030
1600-1700	CKFX, Vancouver, Canada.....	6080
1600-1700 S	KCBI, Texas.....	11735
1600-1700	KNLS, Alaska.....	7355
1600-1700	KYOI, Saipan.....	9665
1600-1700	Radio Australia.....	5995, 7205
		7215, 9580
1600-1700	Radio Beijing.....	9570, 11600
1600-1700	Radio France International.	6175, 9860
		11705, 11840
		17620, 17790
1600-1700	Radio Jordan.....	9560
1600-1700	Radio Korea.....	5975, 9870
1600-1700	Radio Malawi.....	3380, 5990
1600-1700	Radio Moscow.....	11840, 11850
		11860, 11950
1600-1700	Radio Prague, Czech.....	11990, 13715
		15110, 17705
1600-1700	Radio Riyadh, Saudi Arabia..	9720v
1600-1700	Radio Tanzania.....	6105
1600-1700	Radio Zambia.....	9505
1600-1700	Voice of America.....	9575, 15205
		15410, 15440
		15580, 15600
		17785, 17800
		17870
1600-1700	Voice of Nigeria.....	7255, 11770
1600-1700	WCSN, Boston, Mass.....	15270
1600-1700	WHRI, Indiana.....	15105
1600-1700	WINB, Pennsylvania.....	15295
1600-1700	WMLK, Pennsylvania.....	9455
1600-1700	WRNO Worldwide.....	11965
1600-1700	WYFR, Florida.....	9535, 1183
		11875, 1517
		15440, 1784
		21525

# frequency SECTION

1610-1620	M-F	Radio Botswana.....	4820,	7255	1800-1830	Voice of Vietnam.....	9755,	9840	1900-1930	S	Radio Norway Int'l.....	11925,	15310
1610-1645		Radio Belem.....	3205				12020,	12035	1900-1930		Radio Yugoslavia.....	6100,	7240
1630-1655	M-A	BRT Belgium.....	17595		1800-1900	Deutsche Welle.....	7285,	9700				9620	
1630-1700		ELWA, Liberia.....	11830				9745,	11785	1900-1930		Spanish Foreign Radio.....	7275,	9745
1630-1700		Radio Nacional Angola.....	7245,	9535	1800-1850	Radio Nacional do Brasil...	15265					9765,	15375
			11955		1800-1900	4VEH, Haiti.....	4930		1900-1930		Voice of Vietnam.....	9755,	9840
1630-1700		Radio Nederland.....	6020,	9515	1800-1900	AFRTS.....	15330,	15345				12020,	12035
1630-1700		Radio Polonia.....	7125,	9525			15430,	17765	1900-2000		4VEH, Haiti.....	4930	
1630-1700		Radio Sofia, Bulgaria.....	11735,	11840	1800-1900	All India Radio.....	11620,	11940	1900-2000		AFRTS.....	15330,	15345
			15310				15280					15430,	17765
1630-1700		Voice of Africa, Egypt.....	15255		1800-1900	BBC, London.....	6180,	6195				21620	
1645-1700		Radio Berlin Int'l.....	9730				9410,	11820	1900-2000		All India Radio.....	7150,	9665
1645-1700		Radio Pakistan.....	6205,	7100			12095,	15070				11620,	11845
			9560,	9465			15275,	15400				15265	
					1800-1900	CBC, N. Quebec Service.....	9625,	11720	1900-2000		BBC, London.....	9410,	12095
					1800-1900	CFCX, Montreal, Canada.....	6005					15070	
					1800-1900	CFRX, Toronto, Canada.....	6070		1900-2000		B.S. Kingdom Saudi Arabia..	9720	
					1800-1900	CFVP, Calgary, Canada.....	6030		1900-2000		CBC Northern Quebec Serv....	9625	
					1800-1900	CKFX, Vancouver, Canada.....	6080		1900-2000		CFCX, Montreal, Canada.....	6005	
					1800-1900	CKZU, Vancouver.....	6160		1900-2000		CFRX, Toronto, Canada.....	6070	
					1800-1900	KCBI, Texas.....	11735		1900-2000		CFVP, Calgary, Canada.....	6030	
					1800-1900	KNLS, Alaska.....	7355		1900-2000		CKFX, Vancouver, Canada.....	6080	
					1800-1900	KVOH, California.....	17775		1900-2000		CKZU, Vancouver, Canada.....	6160	
					1800-1900	KYOI, Saipan.....	9665		1900-2000		HCJB, Ecuador.....	15270,	17790
					1800-1900	Radio Australia.....	5995,	6060	1900-2000		KCBI, Texas.....	11735	
							6035,	6080	1900-2000	M-F	KVOH, California.....	17775	
							7205,	7215	1900-2000		Radio Algiers.....	9510,	9685
							9580					15160,	17745
					1800-1900	A,S Radio Canada International.	15260,	17820	1900-2000		Radio Australia.....	6060,	6035
					1800-1900	Radio Korea.....	5975,	15575				6080,	7205
					1800-1900	Radio Maputo, Mozambique....	9620					7215,	9580
					1800-1900	Radio Moscow.....	11780,	11840	1900-2000		Radio Beijing.....	9860,	11500
							11850,	11860	1900-2000	TES	R. Discovery, Dominican Rep	15045	
							11950		1900-2000		Radio Havana Cuba.....	11795	
							11675		1900-2000		Radio Kuwait.....	11675	
					1800-1900	MWF Radio Kuwait.....	9553		1900-2000		Radio Moscow.....	11780,	11840
					1800-1900	Radio Nacional, Eq. Guinea...	11780,	15150				11850,	11860
					1800-1900	Radio New Zealand Int'l.....	9720v					11950,	13605
					1800-1900	Radio Riyadh, Saudi Arabia..	6105		1900-2000	MWF	Radio Nacional,Eq. Guinea....	9553	
					1800-1900	Radio Tanzania.....	9505		1900-2000		Voice of America.....	9760,	15205
					1800-1900	Radio Zambia.....	15435					15445,	17800
					1800-1900	RAE, Argentina.....	9550					17870	
					1800-1900	TWR, Swaziland.....	9750,	15205	1900-2000		Voice of Nigeria.....	7255,	11770
					1800-1900	Voice of America.....	15445,	15580	1900-2000		WCSN, Boston, Mass.....	15230	
							17870,	25600	1900-2000		WHRI, Indiana.....	15105	
					1800-1900	WCSN, Boston, Mass.....	15230		1900-2000	S,A	WHRI, Indiana.....	15105	
					1800-1900	WHRI, Indiana.....	15105		1900-2000		WINB, Red Lion, Penna.....	15185	
					1800-1900	WINB, Pennsylvania.....	15400		1900-2000		WMLK, Bethel, PA.....	9455	
					1800-1900	WMLK, Bethel, PA.....	9455		1900-2000		WRNO Worldwide.....	15420	
					1800-1900	WRNO Worldwide.....	15420		1900-2000		WYFR, Okeechobee, Florida..	9535,	11830
							9535,	11580				15566,	21615
							11830,	11875	1910-1920		Radio Botswana.....	3355,	4820
							9725,	12015	1920-1930	M-A	Voice of Greece.....	7430,	9395
							17755					9420	
					1805-1830	A,S Radio Austria Int'l.....	6240,	7295	1930-2000		Radio Beijing, China.....	9440,	11515
					1814-1817	Radio Suriname Int'l.....	7505					11905	
					1815-1900	Radio Bangladesh.....	5910,	9905	1930-2000		Radio Bucharest, Romania....	7145,	9690
					1830-1855	M-A BRT Brussels, Belgium.....	6120,	9610				9750,	11940
						Radio Finland.....	11755		1930-2000		Radio Finland.....	6120,	11755
					1830-1900	Radio Polonia.....	5995,	6135	1930-2000		Voice of Islamic Rep. Iran..	9022	
							7125,	7285	1935-1955		RAI, Italy.....	7275,	9710
							9525,	9675	1940-2000		Radio Ulan Bator Mongolia...	7235,	15305
							11840		1950-2000		Vatican Radio.....	6190,	7250
					1830-1900	Radio Sweden Int'l.....	11845					9645	
					1830-1900	Radio Tirana.....	7065,	9480					
					1830-1900	Swiss Radio International...	6165,	9535					
							9885,	11955					
					1830-1900	Radio Netherlands.....	9540,	17605					
							21685						
					1830-1900	Radio Sofia, Bulgaria.....	9700,	11720					
					1830-1900	Spanish Foreign Radio.....	7275,	9745					
							9765,	15375					
					1830-1900	Radio Abidjan, Ivory Coast.	11940						
					1830-1900	Radio Havana Cuba.....	11795						
					1830-1900	Radio New Zealand.....	11780,	15150					
					1840-1900	Voice of Greece.....	11645,	12105					
							15630						
					1845-1900	All India Radio.....	7412,	11620					
					1900 UTC	[3:00 PM EDT/12:00 PM PDT]							
					1900-1915	Radio Bangladesh.....	6240,	7295					
							9855,	11555					
					1900-1925	Radio Nederland.....	6020,	9540					
							17605,	21685					
					1900-1925	Radio Prague, Czechoslovakia	5930,	7345					
					1900-1930	Kol Israel.....	9010,	11610					
							12080,	13725					
							17630						
					1900-1930	Radio Afghanistan, Kabul....	7160,	9530					
					1900-1930	Radio Budapest Hungary.....	6025,	7220					
							9585,	9835					
							11910,	12000					
					1900-1930	Radio Japan.....	11705						
					1900-1930	Radio Kiev, Ukrainian SSR...	7230,	6010					
							6090,	6165					

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2000-2100	AFRTS.....	15330, 15345	2100-2200	All India Radio.....	7412, 9665	2200-2300	Radio Moscow.....	7195, 9685
2000-2100	BBC, London.....	15430	2100-2200	BBC, London.....	9910, 11620			9720, 9665
2000-2100	CBC Northern Quebec Service.....	9410, 12095			6005, 6175			11710, 11750
2000-2100	CFCX, Montreal, Canada.....	15070, 15260			7325, 9410			11850
2000-2100	CFRX, Toronto, Canada.....	6025, 11720	2100-2200	CFCX, Montreal, Canada.....	12095, 15070	2200-2300	Radio Moscow World Service	9490
2000-2100	CFVP, Calgary, Canada.....	6005	2100-2200	CFRX, Toronto, Canada.....	6005	2200-2300	Radio Pyongyang, N.Korea...	11735
2000-2100	CHNX, Halifax, Canada.....	6070	2100-2200	CFVP, Calgary, Canada.....	6030	2200-2300	R. Vilnius, Lithuanian SSR..	7260, 9640
2000-2100	CKFX, Vancouver, Canada.....	6130	2100-2200	CHNX, Halifax, Canada.....	6130			11790, 11875
2000-2100	CKZV, Canada.....	6080	2100-2200	CKFX, Vancouver, Canada.....	6080			13645
2000-2100	King of Hope, Lebanon.....	6160	2100-2200	Falkland Islands Bcast Svc..	2373	2200-2300	Voice of Free China, Taiwan	15440, 17845
2000-2100	KVOH, California.....	6280	2100-2200	FEN, Tokyo.....	15260	2200-2300	Voice of Turkey.....	9560
2000-2100	KYOI, Saipan.....	17775	2100-2200	King of Hope, Lebanon.....	6280	2200-2300	WCSN, Boston, Mass.....	15300
2000-2100	Radio Baghdad, Iraq.....	9670	2100-2200	KSDA, Guam.....	7160, 11965	2200-2300	WHRI, Indiana.....	9770
2000-2100	Radio Canada Int'l.....	9875	2100-2200	KVOH, California.....	17775	2200-2300	WINB, Pennsylvania.....	15185
2000-2100	Radio Kuwait.....	11945, 15325	2100-2200	KYOI, Saipan.....	9670	2200-2300	WRNO Worldwide.....	11705
2000-2100	Radio Moscow.....	17820, 17875	2100-2200	Radio Baghdad, Iraq.....	9875	2200-2300	WYFR, Florida.....	9535, 11830
		11675	2100-2200v	Radio Jamahiriya, Libya.....	7245			11855, 21525
		11780, 11840	2100-2200	Radio Moscow.....	11675, 11750	2205-2230	Vatican Radio.....	6015, 9615
		11860, 11980			11840, 11860			11830
		15140			11980	2230-2300 S	CBC Northern Quebec Service.	9625, 11720
2000-2100	R. Nacional, Equator Guinea	15106v	2100-2200 M-A	Radio Nacional Angola.....	9535, 7245	2230-2300	Swiss Radio International...	6190
2000-2100	Radio New Zealand.....	11780, 15150	2100-2200 F,A	Radio Zambia.....	9505	2245-2300	All India Radio.....	6035, 7215
2000-2100	Radio Pyongyang, N. Korea...	6575, 7105	2100-2200	RTL, Luxembourg.....	6090			9595, 9912
		9345, 9960	2100-2200	Voice of Africa (Cairo)....	15375	2245-2300	GBC1 Ghana.....	4915
2000-2100	Radio Zambia.....	9505	2100-2200	Voice of America.....	9760, 11760	2245-2300	Radio Korea, South.....	15575
2000-2100	Voice of America.....	9760, 11760			15410, 15445			
		15410, 15445			15580, 17785			
		15580, 17800			17800, 17870			
		17785, 17870	2100-2200	Voice of Asia.....	7445, 9845			
2000-2199	WCSN, Boston, Mass.....	11695	2100-2200	WCSN, Boston, Mass.....	11695			
2000-2100	WHRI, Indiana.....	9770	2100-2200	WHRI, Indiana.....	9770			
2000-2100	WINB, Pennsylvania.....	15185	2100-2200	WRNO, Louisiana.....	11705			
2000-2100	WRNO, Worldwide.....	15420	2100-2200	WYFR, Okeechobee, Florida..	9535, 11830			
2000-2100	WYFR, Okeechobee, Florida..	9535, 11830			11875, 15566			
		11875, 15566			17750, 21525			
		17750, 21525	2105-2200	Radio Damascus, Syria.....	12085			
2005-2100	Radio Damascus Syria.....	9950	2115-2230	Radio Yugoslavia.....	6100, 7240			
2015-2100	ELWA, Liberia.....	11830			9620			
2015-2100	Radio Cairo, Egypt.....	9670	2130-2200 T,F	BBC Falklands Service.....	9915, 11820			
2025-2045	RAI, Italy.....	7235, 5990			12040, 15390			
		11800	2130-2200 S-F	CBC Northern Quebec Service	11720			
2030-2100	Falkland Islands Bcast Svc..	2373	2130-2200	HCJB, Quito, Ecuador.....	11740, 15270			
2030-2100	IBRA Radio.....	6110			17790			
2030-2100	Radio Australia.....	9580, 9620	2130-2200	KGEI, San Francisco, CA....	15280			
2030-2100	Radio Beijing.....	6955, 7480	2130-2200	Kol Israel.....	9010, 9435			
		9440, 11515			11610, 13725			
2030-2100	Radio Netherland.....	9540, 9715	2130-2200	Radio Austria International.	5945, 6000			
		9695, 11740			9870			
2030-2100 M-F	Radio Portugal.....	6170, 9740	2130-2200	Radio Australia.....	15160, 15240			
2030-2100	Voice of Nigeria.....	11770			15395, 17795			
2030-2100	Radio Sofia, Bulgaria.....	9700, 11750	2130-2200	Radio Canada International.	11945, 15150			
2030-2100	Spanish Foreign Radio.....	7275, 9765	2130-2200	Radio Prague.....	6055			
2030-2100	Voice of Vietnam.....	9755, 9840	2130-2200	Radio Sofia, Bulgaria.....	6070, 11720			
		12020, 12035						
2045-2100	All India Radio.....	7160, 9550						
		9665, 9910						
		11620, 11870						
2045-2100	Radio Berlin International.	6125						
2050-2100	Vatican Radio.....	11760						
2050-2025	Voice of Islamic Rep.,Iran..	9022						

## Soviets Start U.S. to Cuba Broadcasts

The Soviet Union began AM radio broadcasts to the United States from Cuba, about the same time it stopped jamming Voice of America transmissions, the United States Information Agency said today.

Charles Z. Wick, the agency's director, said in an interview that the Russians, broadcasting in English, had been "experimenting on an AM frequency of 1040 kilohertz and had announced that they would transmit the programs every other Saturday and Sunday from 8:00 AM to 6:00 PM.

Several stations in Florida and elsewhere in the south are assigned to the frequency, said Mr. Wick, and although there have been no complaints about the soviet broadcasts interfering with American transmissions, a dispute between Cuba and the United States over the frequency is pending before the International Frequency Registration Board of the International Telegraphic Union.

The Soviet move appears to be an effort to put into effect a proposal that was never accepted by the United States. It was offered in Reykjavik, Iceland, last October, when Mr. Wick met with Aleksandr N. Yakovlev, a Secretary of the Soviet Communist Party's Central Committee. Mr. Wick recalled that Mr. Yakovlev offered to stop jamming American broadcasts if the Soviet Union were given access to medium-wave stations in the United States.

"I said there is no way we would bribe you into refraining from illegal activity, i.e. jamming," Mr. Wick said.

Wick later said that he got a letter from Yakovlev saying that since he hadn't gotten any help from me, they were going to start broadcasting from Cuba."

Except for the dispute over the frequency, Mr. Wick said he had no objection to the broadcasts.

*New York Times*  
via Sig hoffman  
Flushing, NY 11355

## 1180 on the AM Dial and a Thorn in Castro's Side

According to a joke making the rounds in Havana these days, Vilma Espin, the highest-ranking woman in the Communist Party and the wife of Fidel Castro's brother, Raul, knocks on the door of a family in the capital.

A housewife asks, "Who's there?" and Miss Espin replies brightly, "It's the best-known woman in Cuba."

With that, the housewife calls over her shoulder, "Children, come quickly! Esmerelda is here!"

Esmerelda is not an endearing nickname for Miss Espin. Esmerelda is the title character in a soap opera that was broadcast daily for months on Radio Marti, a branch of the Voice of America transmitting exclusively to Cuba.

Esmerelda has been superseded by other Radio Marti soap operas. But as the special programming to Cuba goes into its second year, Cubans still tell the joke to illustrate the scope of Radio Marti's audience.

"Everybody listens," says one taxi driver, who added that he preferred that his name not be used in connection with the broadcasts.

Radio Marti is on the air seventeen and a half hours a day from studios in Washington with music, news, entertainment, sports, discussions of such things as politics, religion and health, horoscope readings, and once a week, an hour of taped personal messages from Cubans in the U.S. to relatives back home. The U.S. spends some \$12 million dollars annually on Radio Marti.

*New York Times*  
via Ruth Hesch  
White Plains, NY

## No Moon Trip for Radio Listener

Carl Phillips finds himself earthbound at the very time he was supposed to be winging his way to the moon.

Back in 1958, Phillips was one of ten young people who won the "Why I Want to Go to the Moon" contest on WAKY. The prize was an all-expense paid trip to the moon. But instead of blasting off, the 40 year old Phillips spent a quiet day at home.

Phillips was not shy about trying to cash in on his prize, however. He called WAKY.

Mark Strauss, WAKY's program director told him the station would not honor the promise, even if he had the original prize notification. The station had gone through several owners since Gordon McLendon, the colorful Texan who pioneered the concept of Top 40 radio during the 1950s, bought the station in 1958.

"Yes," said Strauss, "they did offer moon flight tickets right



# Atlanta ARRL National Convention

**JULY 10 -11-12, 1987 ■ ATLANTA, GA  
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**BIGGER!**

**BETTER!**

**BE THERE!**

after WAKY went on the air. And years later, these contests still come back to haunt me."

Hearing that, Phillips had his own confession. "I'll tell you," he said, "I didn't write the thing. Some girl across the street who was infatuated with me must have written about it. Frankly, I don't remember a thing about it."

*Los Angeles Herald Examiner*  
via James Kline  
Santa Monica, CA

## Boynton Beach Station Leaves Air as FCC checks Soviet Signal

A radio station in Boynton Beach [Florida] went off the air briefly at the request of Federal Communications Commission officials who are trying to measure the new Soviet

transmitter aimed at the Americas.

At the request of the FCC, WYFX-AM in Boynton Beach and WHBO-AM in Pinellas Park [Florida], two of 16 U.S. radio stations assigned to 1040 on the AM band, shut down their transmitters as the FCC tried to measure the strength of the transmitter in Cuba. The other stations were also asked to go off the air briefly.

"We went off the air for exactly five minutes beginning at 1:45 (p.m.) while (FCC officials) were doing signal measurements," WHBO-AM radio personality John Boswell said from the Pinellas Park station. "During that time, we could hear Radio Moscow plain as day. (Even afterward) you could hear them on the air talking and playing music."

The broadcasts from Cuba began when the Soviets

stopped jamming Voice of America broadcasts.

U.S. officials say the Soviets are using a frequency assigned to the United States.

*Palm Beach Post*  
via Mary Longo  
North Palm Beach

## Two Plymouths Compare Cultures on Radio Exchange

Radio listeners in Plymouth, England, and Plymouth, Massachusetts, have been perplexed, fascinated and amused by what they have learned about each other through a live radio show being broadcast in both communities.

"It's a shame the British live the way they do with all the pageants and royal pomp," a caller from Quincy told British talk show host Louise Churchill one morning.

The caller said it was unfair for the British to be taxed so highly, in part, to support their monarchy. In response, Churchill said the British cling to tradition and might not mind the "upper crust" so much.

Churchill was hosting a 20 hour, five-day radio simulcast between local station WPLM (99.1 FM and 1390 AM) and her station, Plymouth Sound.

Churchill is one of about a dozen British visitors who are in Plymouth, Massachusetts, this week for the broadcast. They have taken in many of the tourist attractions in the U.S. and several plan to attend a Red Sox game at Fenway Park.

*The Patriot Ledger*  
via Robert Fraser  
Cohasset, Massachusetts

## Regional FCC Director a Stickler for Rules

J. Jerry Freeman was like a kid with his nose pressed up against the candy store window. A lover of electronic gadgets, he watched longingly as

satellite TV dishes sprouted in his neighbors back yards.

For many, the sky-high price tag --several thousand dollars -- put it farther out of reach than the television signals. But money was not Freeman's problem.

"I was dying to get one," said Freeman. But he waited to buy his satellite TV receiver until the day the federal law went into effect, essentially making it clear that private dishes were legal. Freeman is the regional director for the Federal Communications Commission for Virginia and North Carolina. He enforces communication policy and law. "I had to wait until the President signed the legislation," Freeman said. "It was killing me."

"Inquisitive," is how Freeman's boss, F.C.C. Deputy Chief Director Arlan Van Dooren, describes him. "He's a good investigative engineer." And investigate he does. On the agenda today is a business concern's use of a frequency to broadcast financial news. The F.C.C. likes to check on such things. Freeman points to a receiver on his desk, set to the frequency in question. "I haven't heard anything from it yet."

The office also receives complaints from people having trouble with their TV reception, a problem often caused by CBers and easily cleared up. But not always. There's a wild one this morning.

When a complainant went to his neighbor to follow through on the F.C.C. form letter for troubleshooting, he apparently didn't stop there. He shot the Cber.

Also on the agenda is the possibility of fraud in licensing ham radio operators. Freeman says he will talk to government prosecutors about possible criminal charges.

Even with all this work, Freeman wears more hats than a hydra has heads. And still he manages not to get his wires crossed.

*Virginia Pilot Ledger Star*  
via Damon Coble  
Norfolk, Virginia

## SPECTRA-DISPLAY



At last an affordable "Panadapter" for the R-7000 receiver & no modifications. Use with a simple scope & see a new and exciting field of SWling. Discover elusive stations by displaying a full 200 KHz to 10 Mhz "Spectrum" of hidden signals you couldn't "See" before. Zero in on those quick "on-off" signals you never knew existed. Here are some actual displays --

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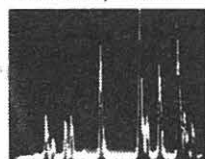
1. 10 Mhz Wide

Center Freq 155 Mhz



2. 10 Mhz Wide

Center Freq 152.5 Mhz



3. 1 Mhz Wide

Photo #2 shows a group of frequencies between 152 & 153 Mhz and photo #3 shows the expanded view of this same group!

Here are some exciting features of the "SPECTRA-DISPLAY"

- $\pm 1$  Db flatness
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## Listener Beware!

We all know that electrical storms are the DX'er's bane for at least two reasons: interference and shock danger. But sometimes we forget to take protective measures, and zzzap! Mother Nature strikes again.

There's a story going 'round about a gentleman named Chuck Rippel. And the point of that story is that you definitely don't want a QSL from a lightning bolt. If a storm comes up, pull the AC cord out of the wall, remove the antenna lead-in and also the ground connection. Make sure all lead-ins to inside the house are disconnected from your rig and are removed to outside of the building. Chuck retells the story: "About 3 years ago my tower took a direct strike. The fiberglass 2 meter antenna on the top of the tower exploded into pieces no bigger than 1/16th of an inch square [and were] found over 1 city block. Three radios were also destroyed even though the antennas were disconnected and grounded through three 20-foot copper pipes washed into the ground. The surge coming from the still-connected grounds or AC main jumped the power switch like it wasn't even there!"

*Listener, beware!* It's a vivid reminder that high electrical power is unpredictable. Don't forget that your telephone and its wires may conduct electricity just as readily as any other metal path; people are killed by electrocution every year while talking on the phone. Another story that goes around is the danger of talking on the phone during a storm. My own father told us that he had seen "fire" shoot a foot or more out of the mouthpieces of old wall-mounted phones during lightning storms. I

never witnessed that phenomenon, but I do remember that our party-line phone would ring each time a lightning bolt struck within a mile or so. I needed no further persuasion to stay off the phone during a storm!

### WTFDA Convention

If you're a TV or FM DXer, you might want to get some information on the WTFDA's convention by Dr. Bruce F. Elving in Esko, Minnesota from July 31 to August 2. A self-addressed, stamped envelope to him at 241 Anderson Road, Esko, MN 55733-9413 will get you more detail.

### IRCA Convention

Another convention of note -- this one of interest to AM DXers, is IRCA's August 14 through 16 bash. That's scheduled for Peoria, Illinois, and the host is John Clemmer. Contact him at 4524 7th Street, #2303, East Moline, Illinois 61244.

### New Stations and Changes

Let's take a look at what you can expect to find on the bands in new stations and changes. Each month from now on I'll try to keep you up on the latest trends, although I can't list every single change that comes along.

On TV, a number of stations are now broadcasting non-stop home shopping programs, aimed at separating you from your money with only a phone call. I believe that nearly all of them are on UHF channels. Some of them will certainly revert to conventional programming when the fad dies down, but don't be surprised if you see them link up with a nationwide net such as Fox Broadcasting or perhaps a satellite net similar to what you find on cable TV. The days of the

three exclusive TV networks and a handful of independents in larger cities is over, thanks to the influence of cable TV, and "narrowcasting" seems to be the key to reaching a specific audience.

Translators and low-power TV stations seem to be coming and going, although a few have gone to full-power status. If you find a VHF channel being rebroadcast on a high-number UHF channel, chances are you are watching a translator courtesy of tropospheric enhancement.

FM programming seems to be diversifying. Four years ago, listeners in Los Angeles, for example, had their choice of about a dozen contemporary hit radio/rock stations to listen to. Now it's down to about four or five, depending upon your classification system. Unfortunately, a format change to a softer sound in FM does not have as much effect on co-channel interference as it does in AM broadcasting, but an adult contemporary format will splatter less than a hard rocker. In LA, the new format creating the most waves (if you'll pardon the pun) is KTWV-94.7, formerly album rocker KMET. Basically a mix of fusion jazz, lighter rock, new age music, and vocals -- with no disc jockeys -- the programming is aimed at the 21-45-year-old set. Hard to imagine? Think of up-tempo Muzak, throw in some surf sound effects, and add 30-second situation vignettes by actors and you have "The Wave". Critics are already predicting the format's demise, but several stations across the country are emulating its sound.

### New Foreign Stations

For AM DX'ers, a few new foreign stations made their appearance this season and should be repeat performers this coming season. Although it's a little early, mark your calendar for early September and October. Worth considering for east-coast DXers is Kvitsoy-1314 Norway, Belgrade-1134 Yugoslavia, and BRT-1521 Belgium. The new religious outlet from Turks and Caicos on 1570 put this country in DX'ers' collections as far away as New Zealand.

Also heard is the new Nicaraguan outlet on 1520 kHz and John Wilkens of Colorado reports hearing a possibly new Mexican on 870 from Guanachocic, Chihuahua, XEKR. It's identifying as "La Voz de la Sierra Tarahumara", in both Spanish and

local Indian language. The move of KUUY, Cheyenne, from 870 to 650 kHz made that catch possible.

### New U.S. Stations

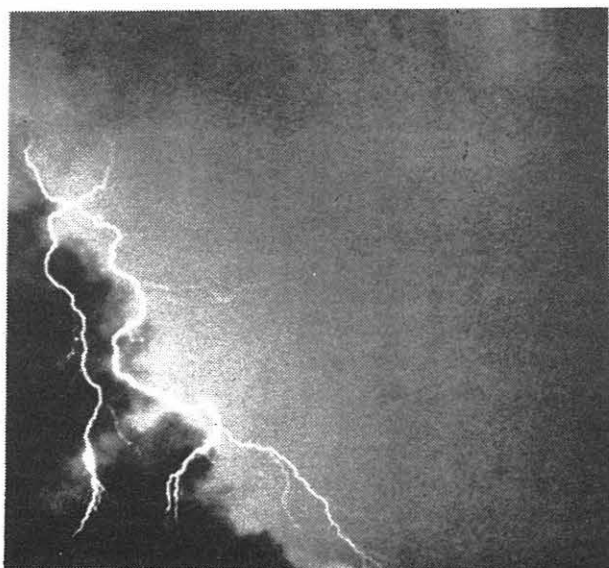
Other clear channels hosting new stations include 540 with KSHO, Hesperia, California; 750, KOAL, Price, Utah; 770, Riverbank, California; and 830, KUYO, Evansville, Wyoming. Most of these stations push a signal to the west; the best times to pick them up should be at local sunset or sunrise.

### Repairs for Tube-type Receivers

It's becoming harder to find technicians who can and will work on tube type communications receivers. I can personally recommend Dave Schneider - P.O. Box 72 - Boiceville NY 12412 (914)657-8768, who is an artist -- especially with the HQ-180's. Dave has the test equipment to work on any hollow-state receiver, and says that he does it at nominal fees as a service to the hobby to keep from getting bored. Don't send him a receiver before checking with him first, though, as his time is limited.

### Have Tape - Will Trade

A final hobby note: I've mentioned earlier that I do trade tapes... and perhaps I need to elaborate a little. From various sources, possibly originally from the DJ's themselves, historic tape recordings of radio broadcasts dating back as early as the '60's exist. Some, of course, have been put on records and sold. But I've discovered that quite a few hobbyists exist who are willing to trade selections on a one-for-one tape basis, thus paying only for the postage and tapes. I can assure you I've had a ball listening to tapes of disk jockeys I grew up with; I never thought I'd hear them again. Who would you give for a 25 year old broadcast of the DJ program you listened to in high school? Well, I happened to have a few program tapes left over from my days in radio... and a quick copy and an hour long broadcast from WHB-Kansas City in September 1964 was mine for the trade. Radio\*Philes is the coordinating organization for this activity should you be interested; you can write directly to Aircheck Central 8644 Orchardvale, Louisville, O 44641, and W.T. Koltek will send you more information for an SASI. Perhaps if you've been taping D and had planned to ditch your use tapes you need to reconsider someone else might just need a copy.



Dr. John Santosuosso is on vacation this month. Pirate reporter Scott McClellan is filling in.

P.O. Box 1116  
Highland City, FL 33846

Scott McClellan

P.O. Box 982  
Battle Creek, MI 49016

## Independence Day Pirate Fest?



Artistry courtesy of Gerald W. Ripley

In years past, the Fourth of July holiday was a time when listeners could expect to find loads of U.S. pirates taking to the air in celebration. In the early 1980s, they even got themselves together and coordinated schedules. Several stations would transmit on the same frequency, one after the other, providing shortwave listeners with hours of uninterrupted broadcasts. It worked out well for everyone -- the pirates would get lots of reception reports and the DXers among us had the chance to add several "rare" QSLs to their collection.

Regretfully, there hasn't been any such pirate-a-thons in recent years. The plain truth is that there's been a decline in bootleg activity. What will happen this July 4th? Will everyone fire up their transmitters and take to the air in a red, white and blue celebration? The answer is unknown but it would be a fine time for the pirates to break out of their slump with a bang, especially since the 4th falls on a Saturday this year.

Take a few minutes out of your celebration to tune across the regular pirate bands on the weekend of the 4th. Look in the following frequency ranges: 1615-1630 kHz, 3400-3480

kHz, and 7350-7480 kHz. You might be surprised. And be sure to let us know what you hear.

### Law Breaker to Law Maker?

Those of you who have been following the free radio scene for several years will remember the name Bruce Quinn. He was the driving force behind Jolly Roger Radio, a long-lived and well-liked pirate which operated on AM, FM and shortwave until they were finally closed by the F.C.C. in November of 1980.

Since that time, Bruce has been attempting to get back on the air -- this time legally. Unfortunately, the astronomical costs of constructing a licensed station in the U.S. has severely hampered his efforts. Legal stations, it seems, employ fairly rigorous standards, both in technical and non-technical aspects.

Bruce has submitted two proposals to the F.C.C. that, if implemented, would make it easier for the average American to build a small AM or FM radio station at a reasonable cost. Here are some excerpts from the proposals:

"The Licensing of Low Power Class D Stations, FM Band (88.1 - 107.9 MHz): This petition requests that the F.C.C. open up the FM broadcast band to low-power Class D stations of 10 watts or less. Also, it is requested that these new low-power broadcasters be allowed to operate commercially on frequencies between 92.1 and 107.9 MHz. ...The F.C.C. has already established technical standards and [channel] separation requirements for Class D stations...

"It is requested that Class D frequencies need not be allocated as long as the applicant can prove that the channel meets the spacing requirements.

"...The F.C.C. will serve the public interest in the following ways if this petition becomes law: 1) Thousands of new channels will become available in this country. 2) Every dreamer who seriously wants a station will be able to get one, somewhere. 3) ...people who love radio, who want to serve their community, and happen not to be rich, [can] participate. 4) Class D stations would be inexpensive to build. 5) Class D stations would serve big city neighborhoods and small towns where no channels are currently feasible. 6) Programming will benefit [allowing the broadcast of] formats that could never survive on a high-power commercial or educational station... 7) Thousands of new voices would be heard on the radio. 8) The F.C.C., by granting this petition, will finally be shutting the door on the currently valid arguments for starting pirate broadcast stations in the FM band."

The other petition Bruce submitted suggests that the frequencies between 1640 and 1700 kHz -- within the extended AM range -- be opened to unlicensed broadcasters using 10 watts or less.

Do these petitions have any chance at all of being accepted? Time will tell. Let's have some input regarding the proposals made above. Would you like to see them become law? If so, there are two places to write. The first is your congressman and the second is me.

There has been some debate over the years whether pirate radio operators go on the air to fill a void or to just to thumb their collective noses at authority. And if the rules Bruce proposed become law, would pirate

operators violate these rules, too, turning commercial channels into anarchy?

Having known perhaps 20 to 30 pirate operators personally, I believe that most of them would love the chance to set up an inexpensive legal broadcast station to operate as a hobby. There are a lot of talented people with very creative minds who do not have the opportunity to show what they can do behind the mike. Even if hired by a commercial station, they must remain within the narrow format dictated by station management. They end up frustrated, and often find something else to do for a living. A few start a pirate station. The pirates I know who broadcast just for the sake of breaking the law have been few.

### Out of the Ether

Kenneth Larsen of South Carolina sends in his logging of KNBS -- Cannabis 41 on 7445 kHz, between 0005 and 0046 UTC. The format was rock music, with lots of commentary by Phil Muzik, ranging from the history of drug enforcement to the benefits of marijuana for medical purposes. The signal suffered interference from Radio Moscow and a numbers station on nearby frequencies. The mailing address for KNBS is via P.O. Box 982, Battle Creek, Michigan 49016. Three first class stamps are requested.

I heard the quasi-legal Radio-Dublin from Ireland on 6910 kHz from 0325 to 0355 UTC with a fair signal, featuring European and U.S. pop music. Some commercials were also heard. The address for a QSL from this one is simple: Radio Dublin, Dublin 8, Ireland.

There's been some activity near 1620 kHz, usually late nights, that is heard throughout the northeastern U.S. Unfortunately, the station doesn't give any identification, all it does is play music -- and drift around a bit. I don't know what the purpose of the station is.

That wraps it up for another month. I'm sure many readers have some strong views -- one way or the other -- about the proposals to the F.C.C. made by ex-pirate Quinn. Why not put them down on paper and send them to me? I might print some of the more interesting and thought-provoking responses in a future column. Until then, good listening.

## Lawrence Magne

Editor-in-Chief  
Radio Database International

With all the recent growth in North Americans' listening to world bandradio, it seems as if more and more of the newer sets on the market are easy-to-operate portables. Of course, this makes sense because newcomers aren't going to shell out megabucks for complicated communications receivers. All they want is something that can give them a taste of what shortwave listening is all about.

But there are portables and there are portables. For a newcomer, the excellent but somewhat complex Sony ICF-2010 might be a bit much. On the other hand, there is a body of opinion that feels that newcomers should obtain the cheapest set possible that has a shortwave band. According to this reasoning, if shortwave is not their thing, they are at least left with yet another AM/FM radio.

The trouble with this well-meaning advice is that a really cheap set provides such poor results that it's all but guaranteed to disappoint. Its howls and squeals make a dreadful first-time impression, and the vague dial markings won't allow the listener to know where he's tuned. So, good-bye to what could have been a lifelong world band radio listener.

Responsible world band radio manufacturers realize this, and so for some time now, have been improving the performance of their portables. For example, Sangean has been upgrading its ATS-803, and nobody can argue with the performance of Panasonic's new RF-B60 which we reported on in the May MT.

It's in this spirit that Sony has replaced its veteran ICF-7600A with the set we've been testing -- the new ICF-7700, sold outside North America as the ICF-7600DA. The old '7600 series is one of the great success stories of world band radio, with sales having passed the million-unit mark some time back. It's the old story about the innovator's getting the lion's share of the market. The '7600A and its '7600 predecessor were the first really decent compact world band portables to hit the market. When Panasonic, Toshiba and others eventually came up with similar sets, they found themselves having to scrounge for the leftovers.

Apparently, Sony doesn't want to upset its successful appletart. So, while the '7700 is a high-tech redesign inside, outside it looks and operates very much like the old '7600A -- an "Oreo radio", if you will. The first clue to this is in the dial. At first blush, it looks just like an ordinary LW/AM/FM/shortwave analog dial, with numbers painted on for the various frequencies and a needle that

goes up and down the dial to show roughly where you're tuned.

But here's the catch. It isn't an ordinary dial and needle at all. Instead, it's a huge LCD that's rigged up to look like a traditional dial face and needle! If you look closely, you can see that the needle doesn't move up and down the dial smoothly. Instead, it goes up in little jerks, one small increment at a time...a tipoff to the real digital nature of this unusual arrangement.

A dial-and-needle frequency readout is inherently imprecise, and that of the '7700 is no exception. So Sony went ahead and added a digital frequency counter to provide greater accuracy.

Why would anybody go to all the trouble to create an analog-looking dial when the set already comes with a digital readout? For one thing, it's a way of allowing the successful '7600 series to evolve further without losing continuity. If Sony had forsaken the analog-type display altogether, they would have created something quite different from the '7700's predecessor. For another, according to Sony, the '7700 is designed to appeal to those who are not comfortable with digital readouts and other modern gadgetry. With the '7700, the listener has a choice between a digital frequency counter and what appears to be an analog frequency readout...even if the "analog" really isn't.

That's not all about the '7700 that's designed to make the technologically faint-of-heart comfortable. Even though the '7700 has a digital tuning circuit, it has no keypad whatsoever. Again, Sony has indicated to us that they don't want to intimidate listeners with too many high-tech aspects, so they've dispensed with the idea of a keypad.

There are five buttons for programmable channel memories, and these work fine. When you're listening to FM, you get five channels for FM. When you're listening to shortwave, you get five for shortwave, and so on. That comes to fifteen channels in all, which is enough for most folks.

Another simplification is that the set tunes only in 5 kHz increments, and there's no control to fine-tune between 5 kHz points. So a single wide bandwidth is used so split-channel broadcasts, such as WRNO on 9852 kHz, can be heard even though the set is mistuned by two kilohertz. This single wide bandwidth means that the set is unselective and gives out more than the usual assortment of howls and squeals. And since you can't detune, there's nothing you can do

about it.

The '7700's ersatz analog dial segments the shortwave spectrum into a dozen separate broadcasting bands. And, sure enough, the radio will tune only within those bands. So, if you want to hear Iran on 9022 kHz or Israel on 7480 kHz, you're out of luck. Still, the coverage is quite generous, so the number of missed stations is small.

Features of the '7700 include an easily set 24-hour digital clock; a sleep switch to allow you to doze off with the radio going; an alarm/clock-radio function to rouse you from your slumber; a power safety switch to prevent the set from going on accidentally in your suitcase; a tuning knob; a slider-type volume control; a two-step tone control; a single-LED "glow light" to aid in tuning; and an elevation leg to angle the radio towards the listener. FM coverage includes both the usual 88-108 MHz band and the lower Japanese FM band.

For whatever reason, no dial light is provided. For \$270 -- yen rise or no yen rise -- it hardly seems to be reasonable to expect listeners to fumble in the dark for matches to see where they're tuned.

One nice aspect of the '7700 is that it uses no computer batteries. True, if the batteries go dead you have to reset the clock and memories. But on a simple set such as this that's a small price to pay for the added convenience and economy of not having extra batteries to worry about.

One unusual feature of the '7700 is that it comes with a 22 1/2', or 6.8 meter, reel-in antenna -- called the AN-6 -- that looks for all the world like a tape measure that uses a wire instead of tape. You simply clamp the end of the wire onto the set's telescopic antenna, then unreel it to wherever you want it hung. It's a great idea, although the case on ours kept popping open accidentally, and it's no fun to reassemble. A piece of tape at the top cures the problem.

Because the '7700 is reasonably sensitive, the AN-6 antenna is of use mostly for daytime listening and listening to low-powered broadcasters within the tropical bands. At night on the lower shortwave bands, the set tends to overload at times just with the telescopic antenna. So more input from the antenna is just about the last thing you'd want. The '7700's tendency to overload is probably why the AN-6 is coupled inductively, rather than directly, to the set. This inductive coupling acts, in effect, like an attenuator.

## The Sony ICF-7700



The '7700's audio quality is clean and crisp for pleasant listening to voice-oriented programs. Music comes through as a bit "tinny", but it's no worse than on most other compact portables.

In all, the ICF-7700 is well and truly designed to appeal to the noncritical listener with an aversion to anything smacking of high technology. At a list price of \$269.95, it's head-to-head competition for the Sony's own forthcoming ICF-2003 -- the replacement for the present ICF-2002 -- and Panasonic's new RF-B60.

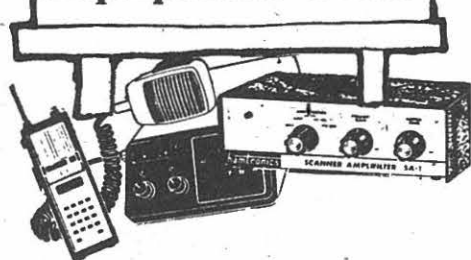
There's no question that Sony has created a technologically non-threatening set. This is a company that knows what it's doing, and it's very possible that legions of people afraid of pocket calculators and microwave oven controls will embrace the '7700. Still, for the beginner, I'd go with the Panasonic RF-B60 unless you're buying a gift for your kindly grandmother who still has trouble figuring out how to tune in UHF TV stations. As a bonus, the Panasonic works better on FM, too. And for those who regularly tune in hard-to-hear signals, the forthcoming Sony ICF-2003 is likely to be preferable.

*You can hear Larry Magne's equipment reviews, along with reports from Radio Database International's Don Jensen and Tony Jones, the first Saturday night each month over Radio Canada International's "SWL Digest" at 8:10 PM Eastern Time on 5960 and 9755 kHz. Larry's "What's New in Equipment" is also featured over "SWL Digest" various other Saturdays throughout the month.*

*A free catalogue of all available RDI White Papers, including the just-released Edition 2.0 "RDI Evaluates Popular Outdoor Antennas", may be obtained by sending a self-addressed stamped envelope to Radio Database International, Box 300, Penn's Park, PA 18943 USA.*

## WHAT'S NEW?

### Equipment Shelf



### Midland Introduces Waterproof CB for Boats

Designed with a waterproof seal and water resistant speaker for marine environments, Midland's new model 77-157 utilizes a 40-channel PLL tuner, audio tone switch, microphone gain control, electrical noise filter, sensitivity switch, combination S/Rf output meter, instant channel 9 access, PA system, and high intensity green readout.

Housed in a marine white cabinet with blue accents, the specially-designed CB radio carries a suggested retail price of \$169.95. More information is available from Midland International, Consumer Products Division, 1690 N. Topping, Kansas City, MO 64120).



### Novice Self-study Ham Radio Course From The W5YI Report

Few publishers in the radio hobby industry have given so much personal and professional time to encouraging radio hobby enthusiasts to get into ham radio as Fred Maia, publisher of the highly-informative W5YI Report. It is only fitting that Fred should receive honors for his new project.

This excellent, shrink-wrapped package contains a 112-page fully illustrated study manual, two long-play stereo cassettes, a new-version Form 610 license application form, and a complete Novice examination in a sealed envelope, all enclosed in a colorful binder.

The professionally-produced package was commissioned by a commercial publisher using the talents of a field of recognized experts. It is due to be in radio stores by July 15th and retailed for only \$19.95.

Designed as a fun approach to ham radio, the study package's cassettes were produced by Gordon West of Radio School fame who has sold more code tapes than anyone else in the country. The package contains everything necessary for the new Novice voice class license.

For more information, including discounts for volume orders, write to the W5YI Report, PO box 10101, Dallas, TX 75207.



### Regency Mobile Scanner Antenna

Timed for release with the new mobile "Informant" scanner, Regency's MA-547 low/high/uhf magnetic mount antenna is also available with a mirror mount for cars, trucks, RVs, and vans.

Under 30 inches in height, the MA-547 (and MA-548 mirror mount version) carry a suggested retail price of \$49.95.

Speaking of the Informant, that scanner was initially available only at truck stops! Regency has told us that as of this writing, however, the INF-1 is now available through normal distribution. There is no word on a release date for the INF-2.

### Sneak Preview

June was the month for the summer Consumer Electronics Show (CES) in Chicago. Several new products were displayed by leading scanner manufacturers.

Uniden showed three new models: BC100XLT (200 memory channel, available September); BC580XLT (new mobile model, available August); and BC300XLT (continuous coverage, available November).

Rumor has it that ICOM's R7000 will be facing serious competition from a lower cost, VHF/UHF, general coverage receiver to be offered by another off-shore manufacturer.

Cobra displayed a new hand-held programmable with 800 MHz

coverage small enough to be tucked in a shirt pocket! This little gem, also imported, is being custom manufactured for Cobra.

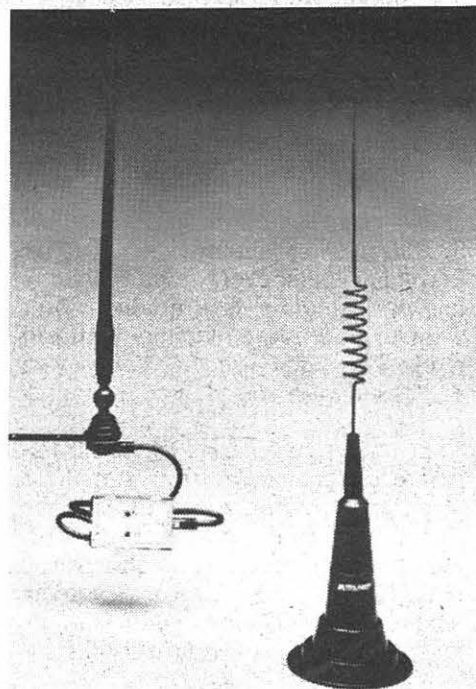
Mike Perlman will have a full report, with photos, in the August issue of MT.

### Cellular Look-alike and Tri-band Mobile Antennas from Midland

Looking for all the world like the familiar pig-tailed cellular mobile antenna, the new Midland 18-2985 magnetic-mount mobile CB antenna comes prewired and factory tuned with a suggested retail price of \$34.95.

A companion model 18-236 is a tri-band mobile antenna designed for CB, AM and FM car radios. It features a 16" ruggedized mast connected by 12 feet of coaxial cable and split by a coupler to feed both a CB and a conventional AM/FM car radio.

For more information contact Midland at the address given previously.



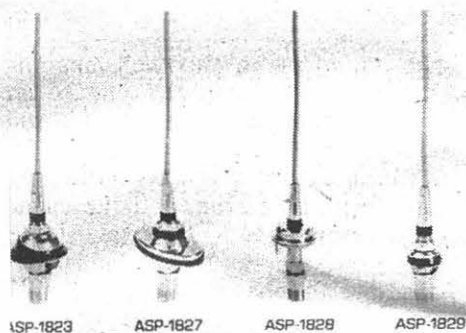
### 800 MHz Disguise Antennas From Antenna Specialists

Designed to thwart theft of cellular mobile radios or to avoid detection of undercover law enforcement vehicles, a new line of 800 MHz band mobile antennas has been introduced by Antenna Specialists.

Each antenna in the series is a cosmetic match for Ford (ASP-1827), Chrysler (ASP-1828), and a universal replacement (ASP-1823 and ASP-1829). All models will withstand 50 watts of power and are provided with swivel mounts for standard 7/8" holes.

Frequency coverage from 821-896 MHz is possible without retuning. Each antenna comes complete with 15 feet of low-loss cable and an optional model ASP-929 coupler permits the use of two-way and AM/FM equipment on the same antenna.

Additional information is available from the Marketing Department of Antenna Specialists Co., 30500 Bruce Industrial Pkwy., Cleveland, OH 44139-3996.



### Heil SC-10 S.C.P.C. Receiver

The SC-10 is a specially designed FM receiver that plugs into an existing 70 MHz home TVRO system. To receive live sports and network feeds, remote broadcasts, live futures, agriculture reports, national public radio and music networks from classical and oldies to rock and country.

The Heil SC-10 will tune from 51 MHz through 100 MHz and comes complete with all necessary splitters, cables and connectors plus six pages of instructions and preliminary S.C.P.C. program guide.

SC-10 suggested retail price is \$89.00 (+ \$4 UPS). For more information, write or call the communications division at Heil, Ltd.





## Net Directory

1987 edition published by the ARRL (44 pages, 8-1/2" x 11", offset printed and staple-bound; \$1 from the American Radio Relay League, 225 Main St., Dept MT, Newington, CT 06111)

If you enjoy monitoring (or participating in) amateur radio special service or interest networks, this comprehensive new directory is the consummate reference, covering all ham bands from 160 through 6 meters.

Scanner and shortwave listeners alike will benefit from the informative discussions to be heard on just about every subject imaginable from chess to computers, and maritime mobile to disaster relief.

An appendix contains forms for interpreting ARRL numbered messages, hints on organizing and running nets, and other useful data for the monitor or net member. An excellent value.

## The ARRL Repeater Directory

(425 pages, 3" x 5" pocket guide; \$4 from the American Radio Relay League, 225 Main St., Dept MT, Newington, CT 06111)

For the first time, this new edition of the famous guide amateur VHF and UHF repeaters is small enough to be carried in a shirt pocket or readily stowed in the glove compartment of a car for handy interstate mobiling.

Conveniently cross referenced by band and state, subcategories include alphabetized cities within the states and numeric sequence of repeaters in those cities.

A comprehensive list of special service clubs, their addresses and meeting schedules is included, along with a glossary of "repeater lingo", and an in-depth band plan for repeaters along with access tones.

As with all League publications, this little handbook is crammed with useful monitoring information for VHF/UHF enthusiasts at a bargain price.

## Haruteq Scanner Book

Ontario edition by Bart Veerman (138 pages, 8-1/2" x 11", spiral bound; \$14 plus \$3 shipping (all in Canadian funds) from Haruteq, PO box 9268, Stoney Creek, Ontario, Canada, L8G 3X9)

With the tremendous amount of VHF and UHF radio activity in the province

of Ontario, Canadian residents and bordering Americans as well will benefit from the comprehensive listings to be found in this new scanner directory.

Containing continuous listings from 30-960 Mhz (with the exception of radio and TV broadcasting allocations), this Haruteq publication is useably cross referenced by frequency and location.

Handy introductory pages and special appendices discuss typical frequency bandplans, amateur repeater pair and locations, railroad assignments, marine radio channels, police dispatch codes, and even a listing of AM and FM broadcasting stations!

An unusual center section presents how-to suggestions for scanner antennas, interference filters and broadcast reception.

## The Communication Post (subscription)

Technically-inclined radio hobbyists will enjoy reading the eight-page, twice-monthly issues of this interesting offset publication. Technical hints with illustrations and a buy/sell swap column highlight the contents.

A subscription is \$9.95 for 24 issues, but if you would like to sample its contents first, send a large, self-addressed stamped envelope with your request to The Communication Post, box 1771, Grand Forks, ND 58206-1771.

## The Travelers Information Station/Highway Advisory Radio

(By Wilhelm Herbst (167 pages, 5-3/4" x 8", perfect bound; \$9.95 plus \$2 mailing from GILFER Associates, 52 Park Avenue, Park Ridge, NJ 07656)

H'ar 'tis! The first comprehensive directory of HAR (highway advisory radio) and TIS (travelers information station) installations for motorists in the U.S. and Canada. If you've ever passed a sign with a message, "Tune your car radio to 530 (or 1610) for road information" or something similar, you have been exposed to these low power services.

TIS and HAR broadcasts use endless loop tapes and may be heard at numerous parks, road construction sites, national forests, and other regulated locations across the continent. This esoteric directory of such transmitter installations is incredibly detailed, featuring scripts of recorded messages, facsimiles of agencies' records, illustrations of typical equipment and installations, painstakingly indexed and cross-referenced by call sign and state (or province).

## GROVE'S CLEARANCE SALE Used Equipment - New Books

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## COUPON COUPON COUPON

## A Review of the CATPACK9600 Computer Interface for the Yaesu FRG-9600

by Bruce Frederick, KA1FGY/AG

In a previous issue of *Monitoring Times* (Behind the Dials, April, 1987), I discussed some of the features and limitations of the Yaesu FRG-9600 receiver.

I would like to describe another aspect of this rig: using the FRG-9600 with the optional Commodore 64 computer interface package. This interface won't turn the duckling into a swan, but it does give the FRG-9600 some wings that allow it to fly.

### The Package

CATPACK9600/C64 (part number is CP0/C01), although marketed as Yaesu product, is produced by Applied Solutions, the same people who develop interface packages for Yaesu's line of ham transceivers.

Yaesu states that Apple and generic RS-232 versions also exist, but I can only comment on the Commodore 64 version which also works with the Commodore C128 in C64 mode.

### What It Does

Yaesu refers to its line of computer interfaces as the "CAT System," for Computer Aided Transceiver. The CAT system was initially developed for the Yaesu amateur radio equipment line, and Catpack9600 is a cut-down version that has been developed for the receive-only FRG-9600.

The whole purpose of the Catpack interface is to let you make the radio do what you want, to add features just the way you want them. You hook up your home computer to the Yaesu FRG-9600, write programs incorporating some Catpack-provided tools to implement the features you want, and control your radio from the computer.

For example, the interface can help you improve the limited search and scan capabilities of the barefoot FRG-9600. Or, you can write programs to organize, store, and recall frequencies.

### What You Get

The Catpack actually consists of two parts: AP64/9600 hardware interface and Catpack9600 software.

Like the FRG-9600 itself, the Catpack9600 has some limitations that detract from an otherwise good product.

The "hardware interface" turned out to be a kit consisting of a small circuit board, a DIN connector, a four-foot length of unshielded cable, and a single sheet of instructions

telling me I needed a four-foot length of shielded cable (see photo)! The circuit board contained one edge connector (installed upside down, which made pin identification an adventure) and a single 56K resistor.

The instruction sheet also said I should probably go out and buy a DB-9 connector 'cause they hadn't supplied it! The DB-9 lets you read the FRG-9600 AGC level through the A/D converter built-in to the C-64 joystick port. This was hardly the impressive interface unit pictured on page 12 of the FRG-9600 Operating Manual.

I was disappointed, but I hoped that the software half of the package would justify the \$79.95 retail price of the package. My personal opinion is that it does not, but I can't say I regret buying the product. It's just overpriced for what you get.

The software consists of three components: a set of routines called "Catcalls" that you use to write your own programs; a couple of demos demonstrating how to use Catcalls; and a stand-alone program called FRQ-FINDER9600 that seeks out and logs active frequencies within a specified range. The Catcalls are four machine-language routines that let you control the 9600 from your own Basic programs. They (1) initialize the interface (2) send a frequency to the FRG-9600 (3) send a mode to the FRG-9600 and (4) read the signal strength and squelch condition.

The Catcalls are fine as far as they go. They provide all the functionality you need to build a controller program. The problem is that even

with the Catcalls, Basic just doesn't provide enough power or speed to create a really decent scanning program. Even if you are a very good Basic programmer and manage to pack in all the features you want, the software may run so slow as to be almost useless.

To get a better handle on the performance limitations, I wrote a simple program that used a FOR-NEXT loop which sent a frequency down to the FRG-9600 and then read and printed the signal strength.

Even without calculating new frequencies or modes and without analyzing the returned values, the routine took over six seconds to execute fifty times ... the equivalent of scanning 50 channels. My handheld Regency 1500 scans 50 channels in about four seconds.

My colleague, Robbins Wells (who can write programs faster than I can read them), has developed a homebrew hardware/software interface which makes the FRG-9600 scream along at 55 channels per second -- with lots of bells and whistles. Still, 50 channels in six seconds is more than three times faster than a barefoot FRG-9600. Even if you assume major performance degradation by writing a complicated Basic program, you may still get acceptable performance as long as you design your programs for performance as well as functionality.

### FRQ FINDER9600: Making the 9600 Soar

As I mentioned earlier, Catpack9600 includes a stand-alone program called Frq-Finder9600. Since it is written in machine language rather than in Basic as with Catcalls, it is a screamer and shows what the Yaesu FRG-9600 is really capable of doing.

For example, Frq-Finder9600 can make a pass through the entire 225-400 MHz military aero band in under three minutes (it takes my Regency 7000 about 22 minutes to do the same thing!). During the pass, Frq-Finder9600 logs any activity it has encountered. You control the speed, mode, search range, filter value, and step increment through a set of variables you set at the start of a session.

With this utility, you can set the program running when you go to work and have a record of all active frequencies waiting for you when you come home at night. Combine this with a tape recorder, and you have a formidable tool for mapping out activity on unexplored frequencies.

### The Bad News ...

Unfortunately, Frq-Finder9600 also has a couple of drawbacks:

1) The program optionally stores a record of any active frequencies in a Commodore sequential file; however, they forgot to provide a utility which lets you read this file once it's created! Luckily, you can read sequential files with many Commodore word processors; otherwise you will have to write your own utility, which isn't too difficult.

2) The program stops on a frequency when the squelch breaks but, unfortunately, the program has often already moved to a different frequency before it realizes that it has a signal. You have to fine tune the search by slowing the speed, decreasing the step size and setting a filter value for the utility to reliably catch transmissions. All of these things negatively impact performance.

### Suggested Improvements:

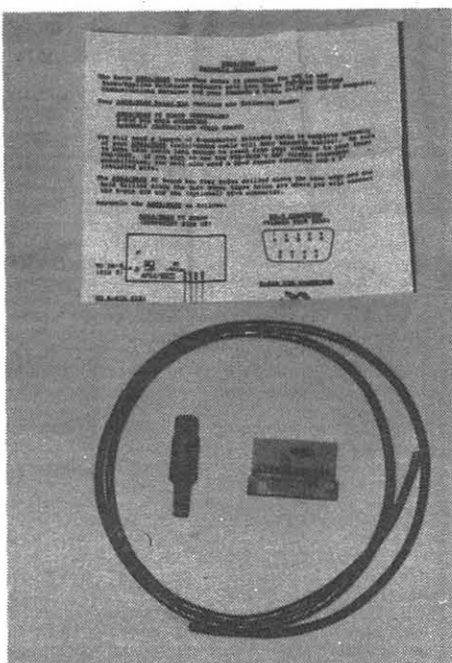
If a price decrease is not possible, then the following improvements to the product might justify the high cost:

- Provide a more complete toolkit of machine language routines to improve performance and/or supply more canned applications like Frq-Finder9600
- Include the DB-9 connector in the hardware interface or, better yet, provide real interface that incorporates an analog-to-digital converter such as a TLC548, rather than use the C-64's notoriously unstable game port
- For \$79.95, it would be nice to get assembled interface (although if they have to cut corners somewhere, it might as well be here)
- Add a utility to read the sequential files created by Frq-Finder
- Provide shielded cable (or at least remove the reference to it from the installation sheet).

### How to Get the Most from the Package

Even if you are not much of a programmer, you can get some immediate benefits from Catpack9600. The Frq-Finder9600 utility is useful and really lets you capture some of the power of the FRG-9600.

Even the Catcall demos can be useful as starting points for simple-minded scanning programs if you don't want



The AP64/9600 "Hardware Interface." Buy your own DB-9 connector, pal!

to build your own from scratch. For example, *MT* columnist Larry Van Horn provided some interesting frequency information in his February 1987 "Signals from Space" column about the FLTSATCOM satellites. These birds cover dozens of frequencies and are almost impossible to fully explore with standard scanners featuring 20 or 50 channels. This would be an excellent application for Catpack9600.

The Catpack demo file called Scanner-1 is a slow, fairly dim-witted scanning program, but it is perfect for the tedious task of plowing through dozens of frequencies over and over.

Just load it in, change the data statements (550 through 680) to reflect the FLTSATCOM channels and modes, change the data statement at 530 to reflect the number of channels you are scanning, and save it off under a new name. You could make different copies of the file with different data statements, reflecting the different frequency plans.

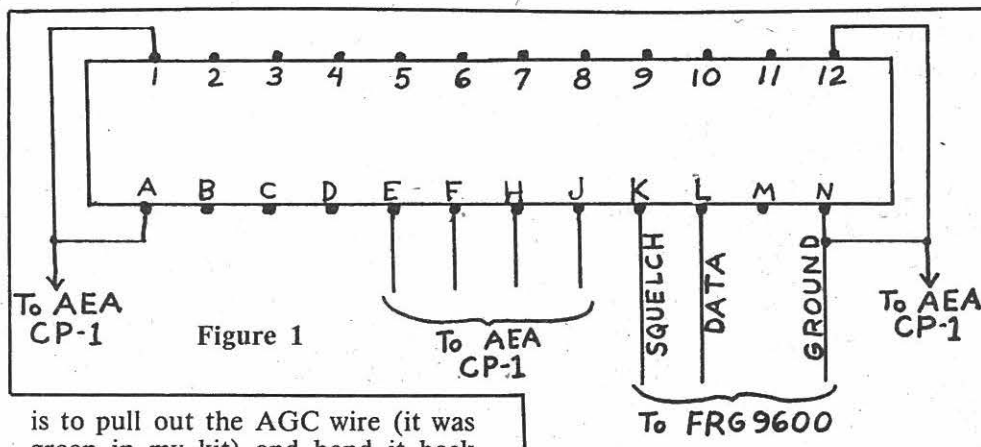
It's not elegant or sophisticated, but it will get you into the FLTSATCOM frequencies within an hour after getting your interface hooked up. And changing data statements using the C64 screen editor is a whole lot easier than punching in scanner channels by hand and tying up your precious channel space.

## Combining Catpack9600 with the AEA SP-1

### CAUTION

Do not undertake the following procedure unless you trust your technical skills and know what you are doing. Errors could void the warranties and damage your FRG-9600, AEA CP-1 and Commodore 64!

1. Make sure that all three devices (FRG-9600, AEA CP-1, and C-64) are turned OFF.
2. Use a small Allen wrench to loosen the strain relief on the CP-1/Commodore 64 connector.
3. Carefully pull back the hood to provide access to the solder connections on the connector.
4. Using an X-Acto knife or other sharp blade, make an incision along the last three inches of the CATPACK cable (C-64 end), making sure that you don't cut or damage the four inner conductors. The goal



is to pull out the AGC wire (it was green in my kit) and bend it back along the cable, leaving the other three conductors inside the outer insulator. Cut off about 1/2" of outer insulation to allow connection of the inner conductors to the solder lugs.

5. Feed the newly-cut end of the CATPACK9600 cable through the CP-1 connector strain relief, leaving the green conductor on the OUTSIDE of the connector and hood; you should have both cables running parallel into the connector (it's a tight fit; make sure that the strain relief is loosened as far as possible. You may have to use small diameter cables if they don't fit).

6. Solder the Catpack conductors to the CP-1 connector as shown in Figure 1. The AGC wire, which is outside the connector hood, should be soldered to a 56k, 1/2 watt resistor, and then to pin 9 of the DB-9 joystick port connector. Secure the resistor to the cable with electrical tape.

## Rolling Your Own

If you are a do-it-yourselfer with a Commodore 64, you may want to experiment with building your own interface or writing your own RS-232 routines.

The first thing you will probably want to acquire that darn DB-9 connector that they failed to supply for reading the AGC level--the package is practically useless without it. When you do, you will probably do what I did and run out to Radio Shack and pick up their DB-9 connector and matching hood.

When you get home, you will discover that the design of the hood does not let you plug the connector into the computer (sigh!). Take an X-Acto knife, chop off the offending plastic clamps, and secure the hood to the connector with a piece of thin wire or string.

If you want to experiment further, you will discover that one of the

advantages of interfacing the C-64 to the Yaesu FRG-9600 is that it's easy to make your own hardware interface.

The Commodore RS-232 port levels are TTL (+5V to -5V) instead of standard RS232 (0 to 12V). Since TTL levels are what the FRG-9600 requires, no level converter is necessary between the C-64 and the 9600: you can wire them directly together. Also, the C-64 has built-in RS-232 software (see pages 348 through 361 of the "Commodore 64 Programmer's Reference Guide"). Yaesu/Applied Solutions chose to write their own routines rather than use the built-in C-64 RS-232 capability, so they don't use the usual RS-232 serial pins.

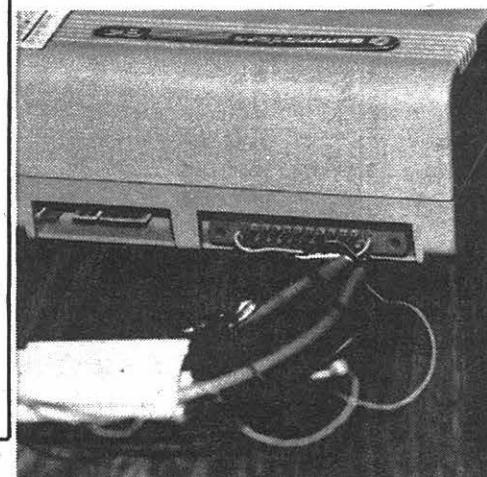
If you decide to experiment with RS-232, connect FRG-9600 pin 3 (DATA) to C-64 User Port Pin M (PA2 or RS-232 Serial Out). Remember, these are different than the pins shown in Figure 1.

Now the baud. The FRG-9600 operates at 4800 baud and the Commodore documentation is incorrect about how to specify that speed. Ignore the optional-baud arguments to the OPEN command -- they don't work. Instead, POKE 665,213 and POKE 666,0 to set the RS-232 port to 4800 baud.

Locations 665 and 666 set the bit timing for the RS-232 port. Ignore locations 661 and 662 which purport to do the same thing. Like the baud speed arguments to the OPEN command, they simply don't work.

To read the squelch signal (FRG-9600 Pin 6) you may want to use just one of the C-64 Port B pins (C through L, PB) through PB7) since you are getting only an ON/OFF signal.

If you want to read the AGC signal level, you can do either what Applied Solutions suggests and go through the joystick port via a 56K, 1/2 watt resistor, or you can build your own interface from an inexpensive A/D converter like the TLC548 and read



AEA CP-1 and Yaesu FRG-9600 interface cables combined on one connector. Note 56K resistor taped to left-hand cable. (Additional cables at right are for different project.)

it through the User Port. I hope to present just such an interface (designed by Robbins Wells) in a future issue of *MT*.

An outboard conversion kit that covers 100 kHz - 60 MHz for the FRG-9600, based on a design presented in the October, 1985, issue *Ham Radio Magazine* article, is available from RADIOKIT (P.O.Box 973, Pelham, NH 03076, 603-635-2235).

You won't be able to run CATPACK programs that access both ranges at the same time, but the kit does address that annoying 60 MHz lower boundary. And you can write separate CATPACK programs to cover the converted range.

With this converter and the CATPACK package, the ugly duckling FRG-9600 starts to look like a real swan. ■

## About the Author:

Bruce Frederick, a computer industry technical writer, specializes in CAD/CAM graphics and has provided professional services to such respected organizations as Lucasfilm Ltd. (*Star Wars*).

A licensed ham for many years (KA1FGY), Bruce has discovered far more fascination with listening than transmitting (a comment we hear from a growing numbers of hams!). His monitoring interests are divided among HF utilities, low frequency beacons, scanning, and shortwave broadcasts.

Bruce's listening post sports an ICOM-745 transceiver, Regency MX7000 scanner, Yaesu FRG-9600 scanning receiver, a Bearcat 220 scanner and other equipment as well, including two Commodore 64 home computers and related peripherals.

## How to Tune the Oldies but Goodies

Ike Kerschne

RD 1, Box 181-A  
Kunkletown, PA 18054



National NC188

There's still a lot of those old, analog radios out there. Many are still in regular use. Others sit in closets, occasionally to be taken down when the urge to DX occurs. Yet others are found at flea markets, interesting little gems waiting for an appreciative owner.

But one thing stands out among all other when it comes to these radios: the inability to tune them in to a particular frequency.

Unlike today's digital display receivers the older units have analogue dials which are difficult to set. But using an analog dial is not all that hard if you have some sort of instruction. Unfortunately, the owner's manuals are often the first thing that gets lost or thrown away.

First, all of the older receivers are calibrated in Mc. (megacycles) and kc. (kilocycles) rather than MHz (megahertz) and kHz (kilohertz). The fact is, the old and new terms mean the same thing.

### Types of Tuning System

There are three popular types of analog tuning systems in use. The first and oldest is chart tuning.

Chart tuning receivers use an arbitrarily-calibrated dial often 0-500. To find a frequency on one of these models, the operator looks at the number under the dial pointer and then checks it against a chart attached to the front panel of the receiver.

Sets of coils are plugged into the receiver to cover a particular frequency range and each coil set has its own calibration chart.

If the receiver was in good alignment, the system worked fairly well and accuracy to within a few hundred Hertz was common with some of the better sets.

The biggest manufacturer of Chart Tuning receivers was National Radio Company. All radios made by them up to the HRO-50 were chart tuned and all were highly prized units in their time. Today, however, they deserve to sit in a place of honor in your shack, a piece of communications history.

### Direct Reading Analog

The Direct Reading system was popularized by the famous Collins Radio Company and adapted by many other manufacturers over the years. It was set up in two basic ways.

With the Collins system, the dial was on a roller or drum that rotated as the band switch was changed. Change the band switch and a new range of frequencies was presented to view. And when the tuning knob was rotated, a pointer moved across the face of the dial, indicating the frequency in MHz. A smaller dial below the knob read the frequency out to the nearest kHz. Some models even had a plate on the tuning knob skirt that would read to within a few Hz and many receivers of this type are as accurate as the finest digital receivers in use today.

The second type of direct reading analog system was far simpler. All the bands were arranged on one dial face and the operator simply consulted the band switch to see which band he was on and then read the frequency in MHz directly off the main dial. Frequency to the nearest kHz and Hz could be read from a smaller dial under the main tuning knob in the same way as in the Collins system.

The advantages to this system are obvious. It was far easier to paint all the frequencies on one piece of plastic and stick it on the front of the receiver than to devise and manufacture a complex drum mechanism and gearing system to drive it. Conse-

quently, accuracy suffered from dial slippage and backlash.

### Bandset-Bandsread

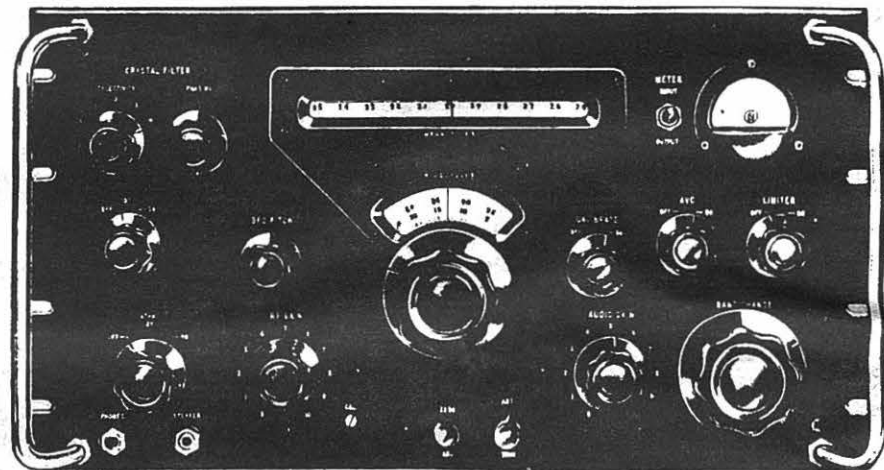
The majority of questions about tuning receivers concerns this system. Most medium and low-priced older receivers used this type of tuning. While this is not really a difficult system to master, some knowledge of what's going on with it is required before mastery can be achieved.

Bandset/bandsread systems all have two tuning dials. One dial is used to set the major range of frequencies to be covered (bandset) and the other dial spreads these frequencies out

over a wide range (bandsread making them easier to tune.

The bandset (main tuning) dial normally marked in wide frequency ranges such as 3 to 6, 60 to 10, 10 to 15 and 20 to 25 MHz (or Mc.). The bandsread dial covers a small portion of this range, usually 50 kHz.

In use, the operator chooses which 500 kHz range he wants to listen to and tunes the bandset dial to the high end of that range. For example, if we choose to tune 6000 to 6,500 kHz, the bandset dial should read 6,500 and by tuning the bandsread control we will be able to fine tune between 6,000 and 6,500.



Collins R388

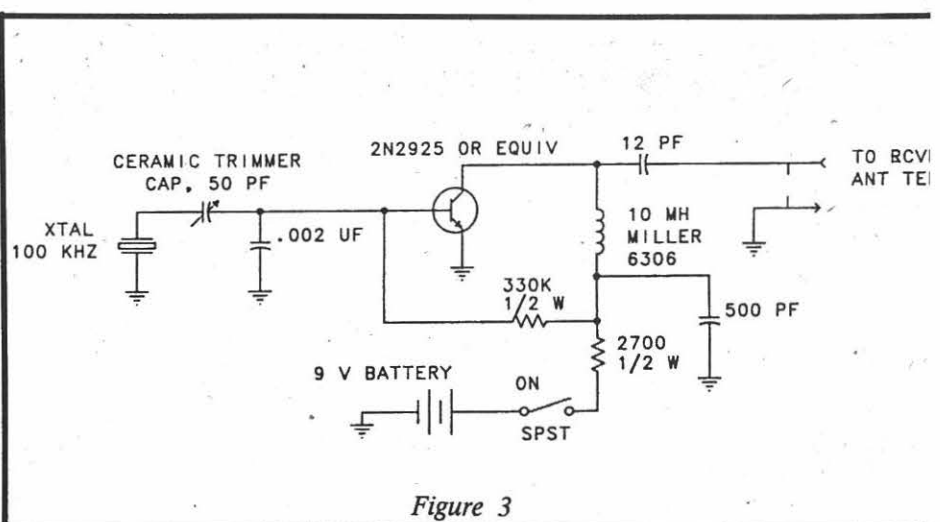


Figure 3

### IS IT THAT TIME AGAIN?

Time to renew sneaks up quickly (like summertime)!  
To avoid missing a single issue;  
use the form on page 61.

We wouldn't want to lose you!

Accuracy with this system is fair with resolution usually within 2 or 3 kHz. True, it's not really great, but close enough to let you find most stations.

The problem is that accuracy is affected by the setting of the Bandset dial and unless it is calibrated right on frequency, the bandspread dial means nothing.

To assure accurate bandspread calibration some of the more expensive receivers had a built-in device called a crystal calibrator that generated a signal every 100 kHz across the dial of the receiver. If your old receiver has one, you'll find a switch marked "Marker," "Calibrate," "Calib.," "100 kc.," or "Xtal calib."

Use of the calibrator is easy: Turn it and the BFO on; set the bandspread control to the high end of the dial (i.e. 100). Now, as you tune the bandset control, you'll hear a beep every 100 kHz. Tune the bandset control to the upper end of the 500 kHz you wish to tune, moving slowly until you hear a high-pitched note.

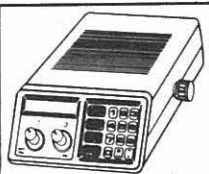
This note will rise in pitch then drop to zero (zero beat) then again begin to climb in pitch. Set the dial to the position where the pitch drops to zero. Now the high end of your range is accurate and you can get the desired frequency easily.

If your receiver doesn't have a crystal calibrator, you may want to build one, using the illustration in figure 3. This simple, low cost unit will make finding those stations a lot easier and it's not all that hard to make.

Build it on a small chassis or perfboard and connect the output to the antenna connection of your receiver. Tune to station WWV on 2.5, 5, 10, 20, or 25 MHz.

Be sure WWV is zero beat on your receiver. Now turn on the calibrator and tune the 50 pf capacitor until the signal from the calibrator is zero beat with the WWV frequency. That's all there is to it. 100 kHz crystals can be purchased from Jan Crystals, P.O. Box 06017, Fort Myers, Florida, 33906-6017. Tell 'em Monitoring Times sent you. All of the other parts should be available from your local electronic parts store or hit the local hamfests (check your local newspapers for dates) and get everything for a fraction of the new cost. If building electronic equipment is new to you, look up a local ham or electronic technician who can give you a hand with construction.

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REGENCY MA-257 Cigarette cord for HX1000/1200	16.99	(*)
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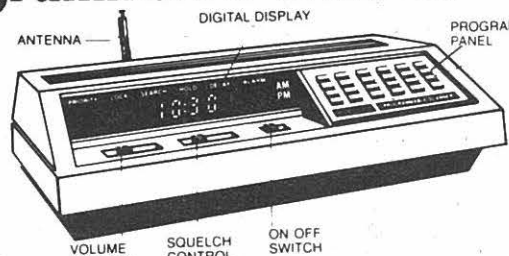
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Other features include scan delay, priority and a bright/dim switch to control the brightness of the 9-digit Vacuum-Fluorescent display. The Z30 can be operated on either 120 VAC or 12 VDC. Includes one year warranty from Regency Electronics (optional 3 yr extended warranty only \$39.99, gives you a total of 4 yrs complete warranty; or 2 yr extended warranty only \$29.99, gives you a total of 3 yrs complete warranty.) Z-30 Service Manual \$5.00.



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(\*) Add (\$) per scanner, and \$3.00\* for all accessories ordered at same time. C.O.D. shipments will be charged an additional \$3.00 per package. Full insurance is included in shipping charges. All orders are shipped by United Parcel Service. Shipping charges are for continental USA only. Outside of continental USA, ask for shipping charge per scanner.

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## HELPFUL HINTS

### BEACONS HERALD HF BAND OPENINGS

Amateur radio beacons around the world, some continuously activated, may be used as propagation indicators. For example, 28 MHz beacons, repeatedly identifying

themselves in Morse code, may be used to predict successful two-way communications with (or monitoring of) that location on nearby frequencies (often including 30-50 Mhz low band skip).

Of the following beacons, most average ten watts output into vertical antennas, although 1 to 100 watts may be occasionally heard into directional beam antennas.

#### 10 Meter Beacons

FREQ	CALL	OPERATION	LOCATION	NOTES
*28.050	PY2GOB		Sao, Paulo, Brazil	15W, Vert.
28.175	VE3TEN	C	Ottawa, Canada	
28.195	IY4M		Bologna, Italy	20W, 5/8 GP Ant.
28.200	GB3SX	C	Crowborough, England	8W, Dipole
28.200	KF4MS	C	St. Petersburg, Fla.	75W, GP
28.201	LU8ED		Argentina	5W
28.2025	ZS5VHF		Natal, RSA	5W, GP at 1850 ft. ASL
28.205	DLØIGI	C	W. Germany	100W, Vert. Dipole
*28.2075	W8FKL	C	Venice, Fl.	10W, Vert.
28.208	WA1IOB	C	Malboro, Mass.	75W, Vert.
28.210	3B8MS	C	Mauritius	GP Ant.
28.210	K4KMZ	I	Elizabethtown, Ky.	20W, Vert.
28.2125	ZD9GI	C	Gough, Is.	GP
28.215	GB3RAL	C	Slough, Berkshire	20W, GP Ant.
*28.215	LU4X1		Cape Horn	
28.2175	WB9MVY	C	Oklahoma City, Ok.	4W, GP
28.220	5B4CY	C	Cyprus	26W, GP Ant.
28.222	W9UXO	C	Chicago, Ill.	10W, GP Ant.
28.2225	HG2BHA	C	Tapolca, Hungary	10W, GP Ant.
28.2275	EA6AU	C	Mallorca, Balearic Is.	10W, 5/8 GP Ant.
28.230	ZL2MHF	C	Mt. Climie, NZ	50W, Vert. Dipole
28.232	W7JPI/AZ	C	Sonoita, Az	5W, 3EL YAGI-NE
28.2325	KD4EC	C	Jupiter, Fl.	7W, GP Ant.
28.235	VP9BA	C	Hamilton, Bermuda	10W, GP Ant.
28.2375	LA5TEN	C	Oslo, Norway	10W, 5/8 GP Ant.
28.240	OA4CK	C	Lima, Peru	10W
*28.2405	5Z4ERR		Kenya	
28.2425	ZS1CTB	C	Capetown, RSA	20W, 1/4 Vert.
28.245	A92C		Bahrain	NW/SE Dipole
28.2475	EA2HB	I	Spain	6W, GP
28.248	K1BZ	C	Belfast, ME	5W, Vert. Dipole
28.250	Z21ANB	C	Bulawayo, Zimbabwe	15W, GP Ant.
28.253	WB4JHS	I	Greensboro, NC	7W, Vert.
28.255	LU1UG		Gral Pico, Argentina	5W, GP Ant.
28.2575	DKØTE	C	Arbeitsgen, W. Germany	40W, GP Ant.
28.260	VK5WI	C	Adelaide, SA, Australia	10W, GP Ant.
28.262	VK2RSY	C	Sydney, NSW, Australia	25W, GP Ant.
28.264	VK6RWA	C	Perth, WA, Australia	
28.266	VK6RTW	C	Albany, WA, Australia	
28.2685	W9KFO	I	Eaton, Ind.	3/4W, Vert.
28.270	ZS6PW	C	Pertoria, RSA	10W, 3EL YAGI on G-land
28.270	VK4RTL	C	Townsville, QLD, Australia	
28.2725	9L1FTN	I	Freetown, Sierra Leone	10W, Vert. Dipole
28.275	AL7GQ	C	Jackson, Miss.	0.5/1W, Broadside Loop
28.2775	DFØAAB	C	Kiel, W. Germany	10W, GP Ant.
28.280	YV5AYV		Caracas, Venezuela	10W, Rotary Beam
28.280	LU8EB		Argentina	5W
28.284	VP8ADE	C	Adelaide Is, NR Antarctica	8W, V Beam to G-land
28.286	K1YE		NR Rochester, NY	2W, Vert. Dipole
28.287	W80MV		NR Ashville, NC	5W, GP Ant.
28.287	H44SI	C	Solomon Is.	15W
28.288	W2NZH	I	Moorestown, NJ	3W, GP Ant.
28.290	VS6TEN	C	Hong Kong	10W, Vert.
28.2925	LU2FFV		San Jorge, Argentina	5W, GP Ant.
28.296	W3VD	C	Laurel, MD	1.5W, Vert. Dipole
28.299	PY2AMI	C	San Paulo, Brazil	10W, Vert. Dipole
28.300	ZS1LA	C	Stillbay, RSA	20W, 3EL YAGI NW
28.315	ZS6DN	C	Irene, South Africa	100W, Vert. Ant.
28.888	W6IRT		California, USA	5W, GP Ant. Code Practice
*28.890	WD9GOE		Freeburg, IL	
28.992	DLØNF		W. Germany	1W, Delta Loop

C = Consistent

I = Intermittent

## STACKING SCANNER BEAMS

If one works well, won't two work better? It sounded reasonable, so we decided to try it.

On a purely theoretical basis--so the textbooks tell us--there could be as much as 3 dB gain in the forward direction and improved directivity as well. Most scanner listeners aren't all that interested in directivity, but the gain would be desirable.

### THE EXPERIMENT

Two Grove ANT1B Scanner Beams were separated by approximately two feet and interconnected by a short length of 300 ohm TV twin lead which was fed at the midpoint by a standard TV balun transformer. Readings from a number of stable signals were taken across the spectrum.

Next, the pair was separated by four feet, each antenna fed by its own balun transformer, and the pair connected into a standard TV splitter connected in reverse as a signal combiner and readings were taken again.

Finally, the array was replaced by a single Scanner Beam and a third set of readings recorded, both with the antenna near the roof and elevated at full mast extension.

### OBSERVATIONS

Surprisingly, every configuration, stacked or single, high or low, yielded nearly identical results! According to theory, the ideal separation for stacked antennas is between 0.5 and 0.7 wavelengths, but textbooks do suggest that gain is not always realized.

We did notice a slight improvement in directivity, especially at the higher frequencies. For scanner listeners, however, this is not usually desirable since you want to hear everything possible in your listening radius without constantly turning the antenna.

Directivity could be a consideration, however, for direction finding and for nulling out interference.

The height experiment was especially interesting since it showed that the extra expense and effort to elevate an antenna as high as possible may not produce superior results. It is often necessary only to elevate an antenna

high enough to "see" over nearby rooftops; after that, only considerable increase in height will net observable improvement.

The change in elevation for our experiment was from 10 to 30 feet; there might have been one or two dB improvement noted, hardly enough to rave about. It would have been better to concentrate on good coaxial cable, being sure not to use excessive lengths or employ splices in the line.

## PHASING

If you do wish to try stacking two (or more) antennas, it is vital that they be connected in phase, otherwise the signals may partially cancel, decreasing their receivable strengths. Simply note the level on several frequencies with one antenna, then compare with the second antenna connected.

If you note a decrease in signal levels, simply reverse the connections on one antenna, or turn the antenna over.

## LESSONS LEARNED

Classically, the best approach is to specify a single antenna to do the job and feed it with low-loss coaxial cable. Mount it high enough to clear nearby obstructions and away from power lines. Do not use a preamplifier if you live in a metropolitan area or near high powered transmitters (it will likely saturate, weakening reception rather than enhancing it).

## Early Model Bearcat Repair

Parts have run out on several older Bearcat programmable scanners including the BC210, BC220 and BC250. The exhausted inventory primarily concerns custom chips like the microprocessor.

Larry Wiland of Youngstown, Ohio, writes that in some cases Uniden will repair those models if the problems do not involve obsolete parts charging a flat fee (typically \$40-50).

If the radio cannot be repaired Uniden offers a special discount privilege on certain new models allowing a trade-in value for the dead Bearcat. Uniden's repair department may be reached at 1-317-842-2483.



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## More On Unusual Antennas

In response to my column on odd and unusual antennas, I received a very interesting letter from John B. Rowlett, of Seattle, Washington. John, who describes himself as a "certified oldtimer," writes: "Just a few years ago (1923), I attended a strictly regimented boys school." John goes on to describe his experiences in building and using an early crystal-set receiver in spite of the fact that the faculty considered the exercise "more occult than education."

Because broadcasts from a nearby transmitter didn't start until after lights out, he had to hide his radio. And, of course, he couldn't erect just any antenna lest he give his secret away.

Being a resourceful lad, John attached a wire to his bedsprings and another to a nearby radiator as a ground. All went well until one stormy night when the dormitory prefect suddenly decided to check that all the windows were closed properly. John, who was in bed listening to his crystal set at the time, managed to hide the radio in time but unfortunately, the prefect got his feet tangled in the antenna. The resulting commotion "set his radio career back a year."

Undeterred, John went on to bigger and better antennas, spending time on a remote ranch on the sagebrush plains of eastern Washington. Since there was no electricity at this particular location, John's only source of radio was in his car. His antenna was a barbed wire fence that "ran over the scabrock and through the sagebrush for miles." After dark, stations flooded the dial "elbow to elbow -- Chicago, Shreveport, San Francisco, etc." And this far out in the wilderness, the only interference was the nearby howls of coyotes.

Actually, there was one other source of interference and John called it his "early warning system." That same fence that he used as an antenna happened to parallel the "twin ruts called the road." And whenever the rancher was returning home, he knew from the interference caused by the sparks of the rancher's car ignition -- and give his wife enough notice to have his meal warm for him when he arrived at the ranch!

Another reader, Tony Oreluk, of Pittsburgh, Pennsylvania, writes to say that he had "used some strange things for antennas." Like metal radiator covers, wire clothes line,

window screen, a metal rabbit cage (without rabbit), and a clothes hanger. Tony passed along another suggestion he'd heard of but never tried: connecting the receiver to the finger stop of a telephone dial as an antenna. This was a common trick years ago to improve AM radio reception.

### News From Outer Space

Regular readers of this column will recall my discussion of a "gravity antenna" in the odd and unusual antenna column. When I wrote that, I had not heard of any success in the attempts to receive gravity waves by such antennas. Shortly after that column appeared, however, reader Robert L. Fisher, WB8BEL, of Huntington, West Virginia, sent me an article from the January 3, *Science News*. It reported that "individual gravity wave detectors, of which there are several in the world, occasionally record vibrations sufficiently above background levels to qualify as possible gravity waves." The article goes on to point out that scientists are not certain as yet that what they have received are actually gravity waves.

### Waving Radios

In one of my radio riddles, I asked something to the effect of "When we have radio waves, what is it that is waving?" Obviously, it is not the radio itself that waves, so what does wave? In response to this riddle, Bud, from Elko, Nevada, sent me a booklet called "Waving Fields of Radio" by E. Moist.

The booklet is described by its author as a "think piece, abstract and simplified." In reading through it, it seemed to me that it was written from a metaphysical perspective as well as a consideration of physics. Within its 14 pages it discusses such concepts as virtual particles, zero point energy, resonance, and more.

Concerning the concept of ether, the booklet states that "early 20th century physics experimenters did not prove that 'luminiferous ether' did not exist -- they were looking for the wrong type of 'universal fluid medium.'"

In any case, the reason why Bud sent me the book was a section titled, "What Waves When a Radio Wave Waves?" The discussion under that

heading evokes the fields associated with a radio wave in its implied answer. Bud tells me the book is available from A.R.D., Box 323, Coeur d'Alene, ID 83814, but he did not know the price.

### The Phantom Returns

One of the more creative ideas which I've received in my mail comes from Hudson A. Wilken, of Oswego, New York. Hudson sent in a suggested answer to my radio riddle on the definition of a "phantom antenna." Hudson's answer is not the one given in the textbooks, but is an interesting one. He suggested that the term "phantom antenna" referred to the reflected image of the 1/4 wave Marconi antenna. In that antenna, the 1/4 wave antenna element "sees" another 1/4 wave element in the ground, just as you would see another "you" if you stood on a large mirror and looked downward. Since the reflected image of the above-ground antenna element is not real, the name "phantom antenna" seems appropriate to apply here. Not the accepted traditional "dummy load" phantom antenna, but a very creative guess, Hudson.

### Let's Get Practical

And now, something you can use in a practical sense. Frank Shoemaker, of Syracuse, New York, has sent me various ideas as "fodder" for my antenna farm. In one letter, he included an example of a small plastic antenna insulator which you can make from a scrap of plastic. For light, temporary antennas, you could even use plastic cut from a plastic bottle. The insulator, shown in figure 1, can be made to any size the builder might wish, in order to accommodate various sizes of antenna wire. Thanks for the tip, Frank. Figure two shows a way that three of the insulators could be used with a dipole.

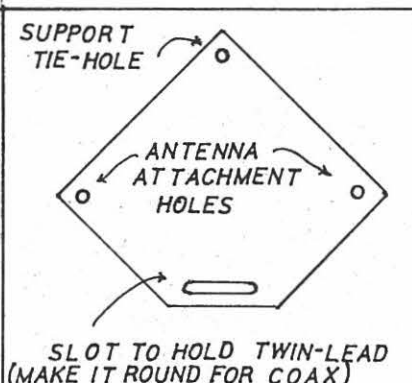


FIG.1. HANDY HOME-BREW ANTENNA INSULATOR.

Clem Small, KR6A/1, CET

R.R.1, Box 181  
Salisbury, VT 05769

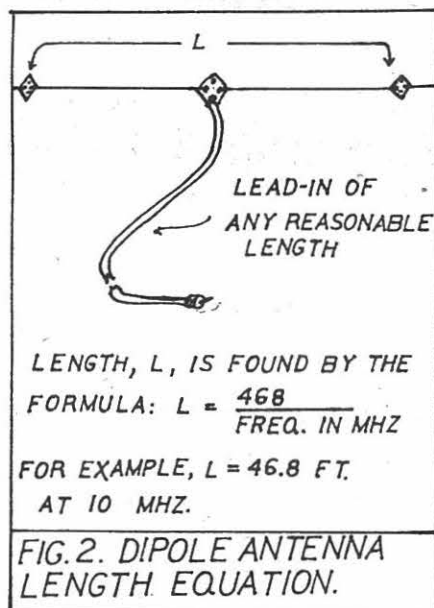
### Last Month's Radio Riddle

Last month I asked you if you had heard of the "hydrochloric acid" or "HCL" antenna. Although I discussed water antennas in past columns, this kind of "liquid" antenna was a new one to me. It was sent in by reader Ed Charlton, W5MD, of Baton Rouge, Louisiana. As I mentioned when I posed this riddle, the HCL antenna is not a specific antenna type, but is really a description of some factors which could cause you to call an antenna by such a name.

As we all know, when an antenna expert writes a suggestion as to what are good points to remember when erecting an antenna, they often tell us to mount it high, mount it in the clear, and for general purpose all-wave monitoring, to make it long. So, "high, clear, and long" are the characteristics of the generic all-wave receiving antenna and thus the name HCL.

### This Month's Riddle

Why is an entomologist who is reading about the anatomy of a bug like a radio buff who reads this column. Hint: it isn't because they are both reading. Tune in next month for the answer.



BNC? Motorola? PL-259? Common technical callouts for antenna connectors, but just what are they? This month MT takes a look at the connectors most often found in consumer radios and includes a pictorial identification. See page 54.



# NOAA Weather Station Update

The National Weather Service VHF forecast network is constantly growing with nearly 400 transmitters on seven different VHF frequencies, most operating 24 hours a day.

The "Voice of the National Weather Service" tapes are revised every 1-3 hours; more frequently if necessary during severe weather when forecasters can interrupt the tape to announce emergency bulletins.

With typical receiving ranges of 40

miles, the hundreds of stations are available to at least 90 percent of the American population. An outside scanner antenna is recommended for listeners in fringe areas.

While any programmable scanner can receive these stations, there are also specially-made weather-band-only radios available as well. Some are equipped with emergency alarms which are activated automatically during serious weather hazards or national emergency.

## Legend-Frequencies are identified as follows:

- (1)-162.550 MHz
- (2)-162.400 MHz
- (3)-162.475 MHz
- (4)-162.425 MHz
- (5)-162.450 MHz
- (6)-162.500 MHz
- (7)-162.525 MHz

## Location Frequency

<b>Alabama</b>		<b>Fort Myers</b>	3	<b>Maryland</b>	
Aniston	3	Gainesville	3	Baltimore	2
Birmingham	1	Jacksonville	1	Hagerstown	3
Columbia	4	Key west	2	Salisbury	3
Demopolis	3	Melbourne	1	<b>Massachusetts</b>	
Dozier	1	Miami	1	Boston	3
Florence	3	Orlando	3	Hyannis	1
Huntsville	2	Panama City	1	Worcester	1
Louisville	3	Pensacola	2	<b>Michigan</b>	
Mobile	1	Tallahassee	2	Alpena	1
Montgomery	2	Tampa	1	Detroit	1
Tuscaloosa	2	West Palm Beach	3	Flint	2
<b>Alaska</b>		<b>Georgia</b>		Grand Rapids	1
Anchorage	1	Athens	2	Houghton	2
Cordova	1	Atlanta	1	Marquette	2
Fairbanks	1	Augusta	1	Onondaga	1
Homer	2	*Baxley	7	Sault Sainte Marie	1
Juneau	1	Chatsworth	2	Traverse City	2
Ketchikan	1	Columbus	2	<b>Minnesota</b>	
Kodiak	1	Macon	3	Detroit Lakes	3
Nome	1	Pelham	1	Duluth	1
Petersburg	1	Savannah	2	International Falls	1
Seward	1	*Valdosta	6	Mankato	2
Sitka	1	Waycross	3	Minneapolis	1
Valdez	1	<b>Hawaii</b>		Rochester	3
Wrangell	2	Hilo	1	Saint Cloud (P)	3
Yakutat	2	Honolulu	1	Thief River Falls	1
<b>Arizona</b>		Kokee	2	Willmar (P)	2
Flagstaff	2	Mt. Haleakala	2	<b>Mississippi</b>	
Phoenix	1	Waimanalo (P)	2	Ackerman	3
Tucson	2	<b>Idaho</b>		Booneville	1
Yuma	1	Boise	1	Bude	1
<b>Arkansas</b>		Lewiston (P)	1	*Columbia (R)	2
Fayetteville	3	Pocatello	1	Guilford	2
Fort Smith	2	Twin Falls	2	Hattiesburg	3
Gurdon	3	<b>Illinois</b>		Inverness	1
Jonesboro	1	Champaign	1	Jackson	2
Little Rock	1	Chicago	1	Meridian	1
Mountain view	2	Marion	4	Oxford	2
Star-City	2	Moline	1	<b>Missouri</b>	
Texarkana	1	Peoria	3	Columbia	2
<b>California</b>		Rockford	3	Camdenton	1
Bakersfield (P)	1	Springfield	2	Hannibal	3
Coachella (P)	2	<b>Indiana</b>		Hermitage	5
Eureka	2	*Bloomington	5	Joplin/Carthage	1
Fresno	2	Evansville	1	Kansas City	1
Los Angeles	1	Fort Wayne	1	St. Joseph	2
Lindsay	6	Indianapolis	1	St. Louis	1
Merced	1	Lafayette	3	Sikeston	2
Monterey	2	South Bend	2	Springfield	2
Point Arena	2	Terre Haute	2	<b>Montana</b>	
Redding (P)	1	<b>Iowa</b>		Billings	1
Sacramento	2	Cedar Rapids	3	Butte	1
San Diego	2	Des Moines	1	Glasgow	1
San Francisco	1	Dubuque (P)	2	Great Falls	1
San Luis Obispo	1	Sioux City	2	Havre (P)	2
Santa Barbara	2	Waterloo	1	Helena	2
<b>Colorado</b>		<b>Kansas</b>		Kalispell	1
Alamosa (P)	3	Chanute	2	Miles City	2
Colorado Springs	3	Colby	3	Missoula	2
Denver	1	Concordia	1	<b>Nebraska</b>	
Grand Junction	1	Dodge City	3	Bassett	3
Greeley	2	Ellsworth	2	Grand Island	2
Longmont	1	Topeka	3	Holdrege	3
Pueblo	2	Wichita	1	Lincoln	3
Sterling	2	<b>Kentucky</b>		Merriman	2
<b>Connecticut</b>		Ashland	1	Norfolk	1
Hartford	3	Bowling Green	2	North Platte	1
Meriden	2	Covington	1	Omaha	2
New London	1	Elizabethtown (R)	2	Scottsbluff	1
<b>Delaware</b>		Hazard	2	<b>Nevada</b>	
Lewes	1	Lexington	3	Elko	1
<b>District of Columbia</b>		Louisville	3	Ely	2
Washington, D.C.	1	Mayfield	3	Las Vegas	1
<b>Florida</b>		Pikeville (R)	2	Reno	1
*Clewiston	2	Somerset	1	Winnemucca	2
Daytona Beach	2	<b>Louisiana</b>		<b>New Hampshire</b>	
<b>Fort Myers</b>		Alexandria	3	Concord	2
<b>Georgia</b>		*Baton Rouge	2	<b>New Jersey</b>	
<b>Hawaii</b>		Buras	3	Atlantic City	2
<b>Idaho</b>		Lafayette	1	<b>New Mexico</b>	
<b>Illinois</b>		Lake Charles	2	Albuquerque	2
<b>Indiana</b>		Monroe	1	Clovis	3
<b>Iowa</b>		Morgan City	1	Des Moines	1
<b>Kansas</b>		New Orleans	1	Farmington	3
<b>Kentucky</b>		Shreveport	2	Hobbs	2
<b>Louisiana</b>		<b>Maine</b>		Las Cruces	2
<b>Massachusetts</b>		*Caribou	7	Ruidoso	1
<b>Michigan</b>		*Dresden	3	Santa Fe	1
<b>Minnesota</b>		Ellsworth	2		
<b>Mississippi</b>		Portland	1		
<b>Missouri</b>					

## THREE GOOD REASONS FOR INSISTING ON B & W SHORTWAVE LISTENING ANTENNAS!

### 1 FOR TOTAL COVERAGE

#### Model ASW-90



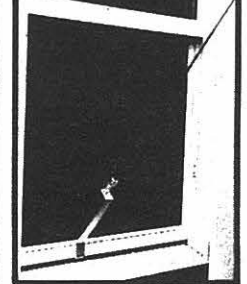
Utilizing the same principles as the B & W world-acclaimed transmitting antennas, this patented receiving antenna provides outstanding coverage of all the frequencies in the shortwave region. With coaxial cable feed, the SWR is less than 2:1 throughout the 3.5 to 30 MHz spectrum. Good MW and LW reception is also provided by this big antenna. Rugged construction with #14 stranded copperweld wire. SO-239 connector for coaxial cable. Only 90 feet long.

ONLY \$79.50

ADD \$4.00 SHIPPING AND HANDLING CHARGES

### 2 FOR PORTABILITY

#### Model ASW-5



Designed for APARTMENTS MOTELS VACATIONS

PRICE \$42.50

ADD \$2.00 SHIPPING & HANDLING

The turn of a thumbscrew will install and remove this sturdy antenna and give you outdoor reception where conventional antennas are restricted. This window-mount antenna extends from 22 in. to 58 in. to provide coverage from 5 MHz to 100 MHz. Its 10 ft. long coaxial cable connects to your shortwave or scanner receiver.

### 3 FOR PEAK RECEPTION WITHIN THE BROADCAST BANDS

#### B & W Model ASW-60\* Dipole Antenna

Covers all shortwave broadcast bands from 11 through 60 meters. Resonant circuits automatically match antenna length to desired band.

#### FEATURES:

- Rugged weather-resistant construction
- Lightweight - Overall length only 35 feet
- Pure copper conductors - cannot rust
- Comes completely assembled - Not a kit

\* Specify desired termination:  
Model ASW-60C - RF Coaxial Connector  
Model ASW-60L - 50 Ft. Twin-Lead Cable

ONLY \$57.50

ADD \$2.00 SHIPPING AND HANDLING CHARGES

Shipping Weight 2 lbs.

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Binghamton	3	Clearfield	1	Midland	2
Buffalo	1	Erie	2	Paris	1
Elmira	1	Harrisburg	1	Pharr	2
Kingston	3	Johnstown	2	San Angelo	1
New York City	1	Philadelphia	3	San Antonio	1
*Riverhead	3	Pittsburgh	1	Sherman	3
Rochester	2	State College	3	Tyler	3
Syracuse	1	Wilkes-Barre	1	*Victoria	2
<b>North Carolina</b>		Williamsport	2	Waco	3
Asheville	2	<b>Rhode Island</b>		Wichita Falls	3
Cape Hatteras	3	Providence	2	<b>Utah</b>	
Charlotte	3	<b>South Carolina</b>		Logan	2
Fayetteville	3	Beaufort	3	Cedar City	2
New Bern	2	Charleston	1	Vernal	2
Raleigh/Durham	1	Columbia	2	Salt Lake City	1
Rocky Mount	3	Florence	1	<b>Vermont</b>	
Wilmington	1	Greenville	1	Burlington	3
Winston-Salem	2	Myrtle Beach	2	*Marlboro	4
<b>North Dakota</b>		Sumter (R)	3	Windsor	3
Bismarck	2	<b>South Dakota</b>		<b>Virginia</b>	
Dickinson	2	Aberdeen	3	Heathsville	2
Fargo	2	Huron	1	*Lynchburg	1
Jamestown	2	Pierre	2	Norfolk	1
Minot	2	Rapid City	1	Richmond	3
Petersburg	2	Sioux Falls	2	Roanoke	3
Williston	2	<b>Tennessee</b>		<b>Washington</b>	
<b>Ohio</b>		Bristol	1	Neah Bay	1
Akron	2	Chattanooga	1	Olympia	3
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Cleveland	1	Jackson	1	Spokane	2
Columbus	1	Knoxville	3	Wenatchee	3
Dayton	3	Memphis	3	Yakima	1
Lima	2	Nashville	1	<b>West Virginia</b>	
Sandusky	2	Shelbyville	3	Beckley	6
Toledo	1	Waverly	2	Charleston	2
<b>Oklahoma</b>		<b>Texas</b>		Clarksburg	1
Clinton	3	Abilene	2	Gilbert	7
Enid	3	Amarillo	1	Hinton	4
Lawton	1	Austin	2	Romney	7
McAlester	3	Beaumont	3	Spencer	6
Oklahoma City	2	Big Spring	3	Sutton	5
Tulsa	1	Brownsville	1	<b>Wisconsin</b>	
<b>Oregon</b>		Bryan	1	La Crosse (P)	1
Astoria	2	Corpus Christi	1	Green Bay	1
Brookings	1	Dallas	2	Madison	1
Coos Bay	2	Del Rio (P)	2	Menomonee	2
Eugene	2	El Paso	3	Milwaukee	2
Klamath Falls	1	Fort Worth	1	Wausau	3
Medford	2	Galveston	1	<b>Wyoming</b>	
Newport	1	Houston	2	Casper	1
Pendleton	2	Laredo	3	Cheyenne	3
Portland	1			Lander	3
Roseburg	3			Sheridan (P)	3
Salem	3				

## TECHNICAL TOPICS

**Terry Staudt, L.P.E., W0WUZ**

716 N. Roosevelt  
Loveland, CO 80537

### Synchronous SSB Reception

To synchronize (as in, "synchronize your watches, men."), one must have a reference. About the only pitfall, if you can call it that, with SSB is the fact that there is no "pilot carrier" or "service channel" as in FM broadcast or microwave.

What these are, simply, are information channels the average user can't hear. The former involves stereo and "elevator music." The latter has the benefit of allowing technicians to talk to each other plus passing status information on different electrical parameters to the control console to warn of impending malfunction. AM and FM may be synchronized because of the constant carrier.

When you receive SSB on your radio, it hasn't the faintest idea as to whether the signal is upper, lower or, for that matter, what the person sounds like.

Aha! You've read that the military can do it and you're right! I'll explain. The armed forces use scrambled SSB for security. A fighter pilot in a violent maneuver or a tank commander on the run really has no time to fool around with something this complex.

Without compromising national security or getting myself into an interview I don't really care to participate in, let me just say that there is a synchronizing component in the signal.

Believe me when I tell you that the first manufacturer to introduce a "ham" transceiver or HF radio incorporating this feature will have his fortune assured. Never say never.

The good news is that the receivers manufactured in the last several years (medium to top grade) with 1 MHz "bands" are PLL (phase lock loop) -- which means no drifting -- and the USB/LSB oscillators are crystal controlled -- again, no drift. The only area for the frequency to wander is the LMO (linear master oscillator). To check this, simply set your receiver to zero beat with WWV some morning and check it in the evening to see if there's still an audible tone. If it's relatively high pitched -- 1 kHz or more -- it needs attention. Otherwise you're in fine shape.

### Connectors - A Little History

*Connectors. That was the topic of last month's scanning column by Larry Wiland. And it seems to have touched a nerve. To our slight surprise (nothing really surprises us), we have had quite a few inquiries about connectors, sooooo.....*

Today, there is a wide range of connectors and adaptors used in electronic equipment. But it wasn't always so. In the beginning, there were thumb screws and springloaded "push tubes" with a hole at the top. There were also a few male and female round or slotted plugs. Period.

About 1938, when radar was invented and someone realized that the frequency spectrum didn't stop at 50 MHz, it was found that sometimes the signals forced through the above-mentioned connectors did.

Research developed the venerable PL-259, or "UHF" connector. It was hardly "UHF," but at the time it was clearly a quantum leap. It remains probably the most-used connector today. With UG/175 and 176 adaptors, it will accommodate all of the common coax in use today and is quite efficient up to 50 MHz.

After World War II, hi-fi was coming of age. And RCA developed a simple connector to meet the needs of the audiophiles of the day, modestly naming after itself: the RCA plug/jack. The assembly was not, however, suitable, for RF.

As a result, laboratories and the military did extensive testing on connectors in the late 1940s. They ruled out the RCA plug and as for the PL-259, came to the conclusion it was lossy and didn't maintain characteristic impedance at really high frequency.

The navy was the first to resolve the problem with the introduction of its Type N unit -- a devil to assemble. There was a companion, a little brother of sorts, called the BNC.

With the advent of CATV and its long runs in fringe areas, coax (high grade) came into use. What to do? The BNC -- enough to drive you crazy -- was expensive to boot.

Enter the "F" Connector. By combining coaxial cable with a solid center conductor, you can produce a cheaply manufactured, easy-to-install, "poor man's BNC." They are 80% as efficient as the BNC, are a one-piece unit, and at seventy nine cents a pair, can be used for a lot of routing around -- VCR, TV, video games, multi-set, multi-house, boosters, and so forth.

Adaptors, such as those made by Amphenol, are quite efficient and simple to use. Many can be found at Radio Shack and other electronics parts houses. The expense involved is usually minus the square of the aggravation! They are the best things available to keep you from kicking your dog into the next county! ■

## Recognizing Those Connectors

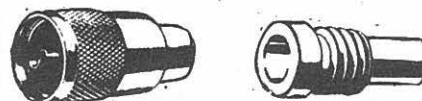
by Bob Grov

### PL-259

Also called a UHF connector, the PL-259 is the most-commonly-encountered RF (radio frequency) connector in the industry.

It is familiar to CB operators, hams and SWLs alike. Primarily intended for heavier cables like RG-8/U and RG-11/U, threaded reducers are available for smaller diameter cables like RG-6/U, RG-58/U and RG-59/U.

The PL-259 is useful for transmitting and receiving at frequencies well into VHF but begins to fall off in performance at UHF (above 300 MHz). Mating female connectors include the SO-238 and SO-239.



PL-259 Male Reducer

### BNC

Now coming to the forefront in wide-frequency-coverage desktop scanners as well as hand-held radios (including transceivers), the BNC combines ease of connection with excellent UHF characteristics.

Conventional BNC connectors are a little harder to install than the PL-259, but newer solderless versions are available. The BNC has enjoyed a reputation for half a century in military and commercial test equipment interconnection.



BNC Female BNC Male

### N

The N connector was developed as an improved version of the PL-259. It maintains its characteristic impedance and low-loss characteristics well into the microwave region through the use of an additional shield connection within the outer shell.

The N connector is commonly encountered in TVRO (satellite earth station installations and receive/transmit applications of types in the UHF and microwave spectrum.

The only receiver or scanner presently utilizing this connector present on the consumer marketplace is the ICOM R7000.



N Female N Male

### F

The lowest cost RF connector presently on the market has surprising performance, although has not met wide acceptance in the communications industry; it is very common, however, in the cable TV industry.

F connectors are readily installed seconds on inexpensive cables like RG-59/U and RG-6/U; the particular connectors will have sufficient cable numbers (F-59, F-56). It is safe bet to use F connectors up to 1000 MHz or higher without measurable loss in received signal.



F Female

F Male

### Motorola

Originally developed for easy installation in the automobile radio industry, this connector was never designed to be used above the megahertz broadcast range. Nevertheless, it saw wide application in the early scanner days because of its familiar automotive use and persistence on the majority of scanners today.

Because of its sloppy slide-in-for-contact design, the Motorola plug is the worst RF connector on the market; it is often preferable to switch to a PL-259 or a UHF/Motorola adaptor combination.

### SOURCES FOR CONNECTORS AND ADAPTORS\*:

Pasternak Enterprises (PO box 16759, Irvine, CA 92713-6759)  
Marlin P. Jones and Assoc. (PO box 12685, Lake Park, FL 33403-0685)  
Nemal Electronics Intl. (12240 NE 14th Ave., N. Miami, FL 33161)  
International Components Corp. (105 Maxess Rd., Melville, NY 11747)  
Philmore Manufacturing Co. (40 Inip Dr., Inwood, NY 11696)  
ORA Electronics (20120 Plummer St., Chatsworth, CA 91313)  
MCM Electronics (858 E. Congress Pk. Dr., Centerville, OH 45459-4072)  
Mouser Electronics (2401 Hwy 287 N., Mansfield, TX 76063)  
Radio Shack (Retail outlets nationwide)  
CZ Labs (55 Railroad Ave., Garnerville, NY 10923)  
J and I Electronics (PO box 62, Carteret, NJ 07008)

\*NOTE: Some companies have a minimum order. Inquire.

for plugging into an existing Motorola female jack.

Many scanner owners have converted their Motorola-equipped scanners to BNC or F connectors for measurable improvement in signal strengths.



Motorola Male

## RCA

The RCA phono plug has occasionally found its way into HF (high frequency; 3-30 MHz) receiver applications (notably Drake). It works reasonably well here, but most RCA connectors are quite rickety in their construction and, thus, unreliable with time.

RCA plugs are best left for phonographs and other audio applications although they serve well for occasional workshop experiments well into VHF.



RCA Male

## TNC

Often used as a high reliability alternative to the BNC, the TNC connector is more frequently encountered in high-end microwave receivers and test equipment. It is available both for semi-rigid and flexible coaxial cable.



TNC Male TNC Female

## SMA

Densely-packaged RF equipment often requires internally-interconnected modules where chassis space is at a premium. This is the application for the miniature SMA connector. Featuring excellent high frequency characteristics, the SMA is popular in military and commercial UHF and microwave test equipment and communications gear.

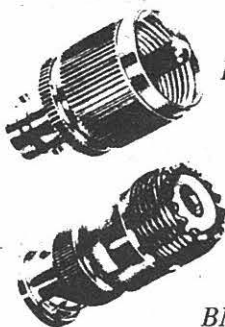


SMA Male SMA Female

## Interseries Adaptors

With such a selection of connectors distributed throughout the marketplace, it is easy to understand how adaptors would be necessary to interface various pieces of equipment.

Virtually every type of interseries adaptor is available--male to male, female to female, male to female--with the exception of the Motorola plug. Coincidentally, the one Motorola adaptor which is available--UHF female to Motorola male--will also work as a UHF female to RCA male plug.



BNC Female to UHF Male

BNC Male to UHF Female

With this background in connectors and their applications, now you are an authority on choosing the right connector for the right job!

# NEW! Turbo Scan™ Scanners

Communications Electronics,™ the world's largest distributor of radio scanners, introduces new lower prices to celebrate our 16th anniversary.

## NEW! Regency® TS2-MA

Allow 30-120 days for delivery after receipt of order due to the high demand for this product. List price \$499.95/CE price \$319.95. **12-Band, 75 Channel • Crystalless • AC/DC** Bands: 30-50, 118-174, 406-512, 806-912 MHz. The Regency TS2 scanner lets you monitor Military, Space Satellites, Government, Railroad, Justice Department, State Department, Fish & Game, Immigration, Marine, Police and Fire Departments, Aeronautical AM band, Paramedics, Amateur Radio, plus thousands of other radio frequencies most scanners can't pick up. The Regency TS2 features new 40 channel per second Turbo Scan™ so you won't miss any of the action. Model TS1-MA is a 35 channel version of this radio without the 800 MHz. band and costs only \$239.95.

## Regency® Z60-MA

List price \$299.95/CE price \$184.95/SPECIAL **8-Band, 60 Channel • No-crystal scanner** Bands: 30-50, 88-108, 118-136, 144-174, 440-512 MHz. The Regency Z60 covers all the public service bands plus aircraft and FM music for a total of eight bands. The Z60 also features an alarm clock and priority control as well as AC/DC operation. Order today.

## Regency® Z45-MA

List price \$259.95/CE price \$159.95/SPECIAL **7-Band, 45 Channel • No-crystal scanner** Bands: 30-50, 118-136, 144-174, 440-512 MHz. The Regency Z45 is very similar to the Z60 model listed above however it does not have the commercial FM broadcast band. The Z45, now at a special price from Communications Electronics.

## Regency® RH250B-MA

List price \$699.95/CE price \$329.95/SPECIAL **10 Channel • 25 Watt Transceiver • Priority** The Regency RH250B is a ten-channel VHF land mobile transceiver designed to cover any frequency between 150 to 162 MHz. Since this radio is synthesized, no expensive crystals are needed to store up to ten frequencies without battery backup. All radios come with CTCSS tone and scanning capabilities. A monitor and night/day switch is also standard. This transceiver even has a priority function. The RH250 makes an ideal radio for any police or fire department volunteer because of its low cost and high performance. A 60 Watt VHF 150-162 MHz. version called the RH600B-MA is available for \$439.95. A UHF 15 watt version of this radio called the RU150B-MA is also available and covers 450-482 MHz. but the cost is \$439.95.

## Bearcat® 50XL-MA

List price \$199.95/CE price \$114.95/SPECIAL **10-Band, 10 Channel • Handheld scanner** Bands: 29.7-54, 136-174, 406-512 MHz. The Uniden Bearcat 50XL is an economical, handheld scanner with 10 channels covering ten frequency bands. It features a keyboard lock switch to prevent accidental entry and more. Also order the new double-long life rechargeable battery pack part # BP55 for \$29.95, a plug-in wall charger, part # AD100 for \$14.95, a carrying case part # VC001 for \$14.95 and also order optional cigarette lighter cable part # PS001 for \$14.95.

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## Improvements for the Icom R7000

by David Cook

11649 Shasta Lane, Oklahoma City, OK 73132

The scan delay mod is quite simple as can be seen by fig. 1. All parts are available at Radio Shack. The circuit consists of a simple 555 timer delay of about four seconds whenever the scan is interrupted by a signal. The unit will not resume scan until four seconds after the termination of a transmission.

An optional delay defeat is provided by using two terminals of the vsc switch, so that when the VSC is pressed, the scan delay is defeated.

The input to the circuit comes from diode D24 on the main unit, located by referring to the owner's manual. After pulling the board loose, unsolder and lift the anode of D24 free of the board.

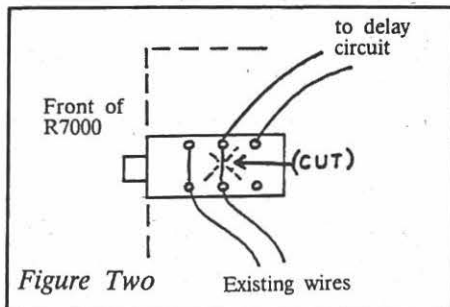
Attach the wire from the input of the delay circuit to the hole where D24 was. I used jumper W22 (near D24) as a source of +9V.

To the loose anode of D24 connect the output of the delay circuit.

Lastly, connect the ground wire from the circuit to a nearby chassis or circuit ground to complete the basic wiring.

The VSC defeat works because there are three SPDT terminals on the switch that, although wired, are redundant and the wiring can be cut and used for our purposes (fig. 2). I used the VSC switch for defeat because the VSC is actually a scan-stop function related to the length of the transmission. If the transmission is less than about one second, the VSC will cancel the delay selected on the front panel of the R7000.

Since my scan delay is not compatible with VSC, I chose to bypass it when VSC is used. Be careful soldering around the VSC switch since it is very cramped.



If desired, the 2 meg resistor in the circuit can be replaced by a 3 or 4 meg trimmer to give an adjustable delay time. The circuit is built on a small perfboard and mounted in the option space on the bottom of the unit with its four wires going over to the main board.

### Changing the Scan Modes on the RC-12 Remote Control

If you have the optional RC-12 remote control, you may be disappointed in the choice of scan functions. Icom provides memory scan, programmed scan and priority scan. Since I use mode scan and selected memory scan mostly, I changed the RC-12 memory scan to mode scan, and priority scan to selected scan.

### SCAN DELAY

As advanced as the ICOM R7000 receiver is, one aggravating oversight has caused more comment than any other. Unlike standard scanners which will wait a few seconds after a transmission has ceased on a channel, the R7000 will not. The listener has a choice of no delay, 5 or 15 seconds delay (whether or not the channel is still busy), or infinite delay.

David Cook claims to have devised a method of making the ICOM behave like a normal scanner, staying on an active channel in the scan mode for about four seconds before resuming its scanning sequence.

While we have not tested his method here at MT, we are reprinting David's letter for qualified experimenters to verify the procedure and would appreciate any feedback our technical readers might have; we know David would appreciate comments and suggestions as well.

For changing memory to mode scan, lift the cathode of D40 on the RC-12 board and attach a wire from this cathode to the cathode of D15 on the logic board, just tack the wire to D15.

To change priority to selected scan, lift the cathode of D42 on the RC-12 board and attach a wire from this cathode to the cathode of D32. Install the RC-12 board and you're finished.

### Computer Control

If you like to have more than 99 channels available, then computer control using Icom's CI-V serial interface may be the solution. Using information obtained from Icom's parts department (ask for the CI-V Interface Supplement), I developed a software and simple hardware inter-

face that allows me to load memory channels by computer.

The hardware interface is a simplified version of the interface shown in the owner's manual; it only transmit from computer to receiver, but that is all that is required for our purposes. All parts are available at Radio Shack.

The circuit is a simple RS232 to TTL converter using the MC1489 quad line receiver (fig. 3). The +5 volt regulator can be any IC regulator and the unregulated DC input can be anything from 9 to 12 volts. I use the wall charger for my Regency HX120 for the DC input.

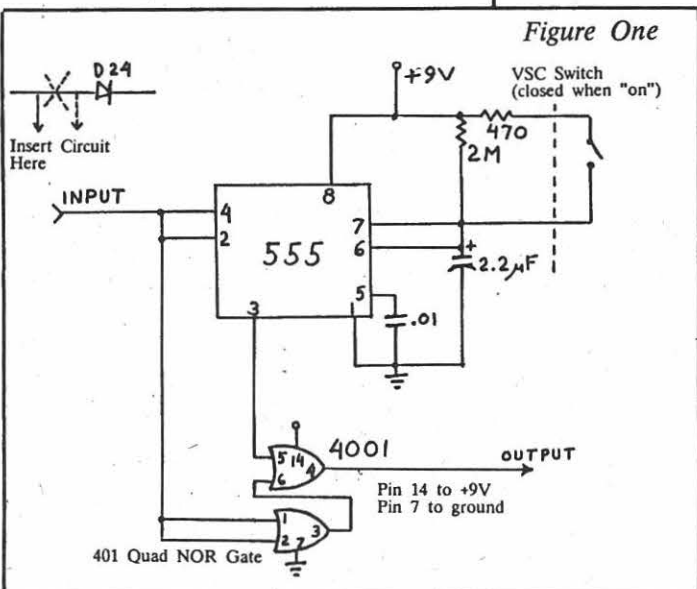
The computer I use for control is a Radio Shack M100 portable. The software driver is in Microsoft Basic so it should work with other machines similarly with some changes depending on the particular operating system used.

My program is an adaptation of the program Icom supplies with the interface supplement titled, *A Simple Icom IC-735 to Commodore 64 Interface* by Chuck Bahr. Many of the functions of the supplied program are not used for the R7000, since the 735 is a transceiver.

The program (see table 1) request the name of a data file which contained channel data. The text file is formatted as follows:

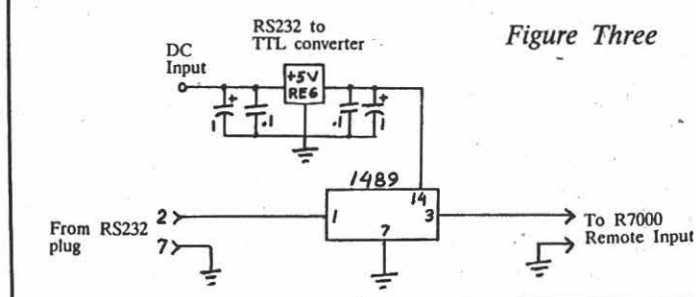
Channel #, Mode, Frequency

Each line of the file refers to a specific channel, with 99 being the highest channel number. Mode is "FM", "FMW", "AM", or "SSB" with FMW being FM WIDE and FM is FM NARROW.



5 CLS  
6 MAXFILES=2  
7 INPUT "NAME OF DATA FILE "; FILE\$  
10 OPEN "COM:53N1D" FOR OUTPUT AS 1  
12 OPEN FILE\$ FOR INPUT AS 2  
15 A\$=CHR\$(254)+CHR\$(254)+CHR\$(3)+CHR\$(241)  
16 B\$=CHR\$(253)  
20 INPUT #2, MEM  
25 MEM=(INT(MEM/10)\*16)+(MEM-(INT(MEM/10)\*10))  
30 PRINT #1, A\$+CHR\$(8)+CHR\$(MEM)+B\$  
32 FOR X=1 TO 50:NEXT X  
35 INPUT #2, MDE\$  
40 IF MDE\$="FM" THEN PRINT #1, A\$+CHR\$(6)+CHR\$(5)+CHR\$(2)+B\$  
45 IF MDE\$="FMW" THEN PRINT #1, A\$+CHR\$(6)+CHR\$(5)+B\$  
50 IF MDE\$="AM" THEN PRINT #1, A\$+CHR\$(6)+CHR\$(2)+B\$  
55 IF MDE\$="SSB" THEN PRINT #1, A\$+CHR\$(6)+CHR\$(5)+CHR\$(0)+B\$  
57 FOR X=1 TO 50:NEXT X  
60 INPUT #2, F  
65 GOSUB 100  
70 PRINT #1, A\$+CHR\$(5)+CHR\$(W)+CHR\$(V)+CHR\$(U)+CHR\$(T)+CHR\$(S)+B\$  
71 FOR X=1 TO 50:NEXT X  
73 PRINT #1, A\$+CHR\$(9)+B\$  
74 FOR X=1 TO 50:NEXT X  
75 IF EOF(2) THEN 80  
78 GOTO 20  
80 END  
100 REM \*\*\* HEX CONVERSION \*\*\*  
105 S=0  
106 T=INT(F)  
107 IF T=100 THEN S=INT(T/100):T=T-(100\*5)  
108 T=(T-(INT(T/10))\*10)+(16\*INT(T/10))  
110 F=(F-INT(F))\*10  
112 U=INT(F)\*16  
114 F=(F-INT(F))\*10  
116 U=U+INT(F)  
118 F=(F-INT(F))\*10  
120 V=INT(F)\*16  
122 F=(F-INT(F))\*10  
124 V=V+INT(F)  
125 F=(F-T)\*10  
126 F=(F-INT(F))\*10  
128 W=INT(F)\*16  
130 F=(F-INT(F))\*10  
132 W=W+F  
134 RETURN

Table One



# A Quality Back-of-Set Antenna for the Icom R70 Scanner

by Larry Wiland

If you are the proud owner of an Icom R-7000 scanning communications receiver you are faced with attaching an antenna to a type N connector. This is due to the receiver's wide-coverage characteristics and its need for an antenna designed for comparable bandwidth. Granted, there are now several outdoor wide-coverage antennas available (Icom AH-7000, Diamond D-130, Grove Scanner Beam, etc.) which can "span" most of the '7000's frequency range, but if you want a back-of-set antenna, you either have to pay upwards of \$20 or so for a commercially-produced one (if you can even find one) or you must build one yourself.

One can screw together several "adapters" to achieve the same results, but this adds several inches to the depth of the radio and looks more like an "afterthought" than an antenna. In my own attempts to eliminate such a "Rube Goldberg" setup, I found a way to build a back-of-set antenna which not only works well, but looks good.

## Picking Up Parts

First, you must obtain the following items to build the antenna. A UG-213 elbow connector for large-diameter coax (Amphenol part #82-326) must either come from a local

hamfest or through of the many larger ham radio stores throughout the country (not at your local Radio Shack store).

This connector comes packaged with all the items shown with an asterisk (\*) on the accompanying illustration.

In addition, you will need one of the "Bearcat" replacement-style antennas widely available at your local electronic store or mail-order supplier (it is a telescoping antenna about 22" when fully extended).

The last parts you will need is a "rubber grommet assortment", available from your local Radio Shack under part #64-3025.

## Let's Proceed

First, unpackage the connector hardware and lay it out on your workbench in the order shown on the diagram. Take the whip antenna (i.e. "replacement antenna"), and screw it

into the "pin center-lead connector" as shown. It should screw in tightly; if not, you will have to file the threads on the antenna base until it JUST FITS into the pin connector.

You may wish to solder the threaded screw into the pin as if you were soldering a center lead of coax cable into this pin. Lay this assembly aside at this point.

Now drop the tapered sleeve into the connector body as shown with the cupped (tapered) side facing UP. Set a 5/16 rubber grommet into this "cup" and lay the crush washer on top. LIGHTLY screw on the cap assembly, but DO NOT YET TIGHTEN IT!

Now, take a 1/4" rubber grommet and slide it half way up the antenna/pin assembly you made in step one.

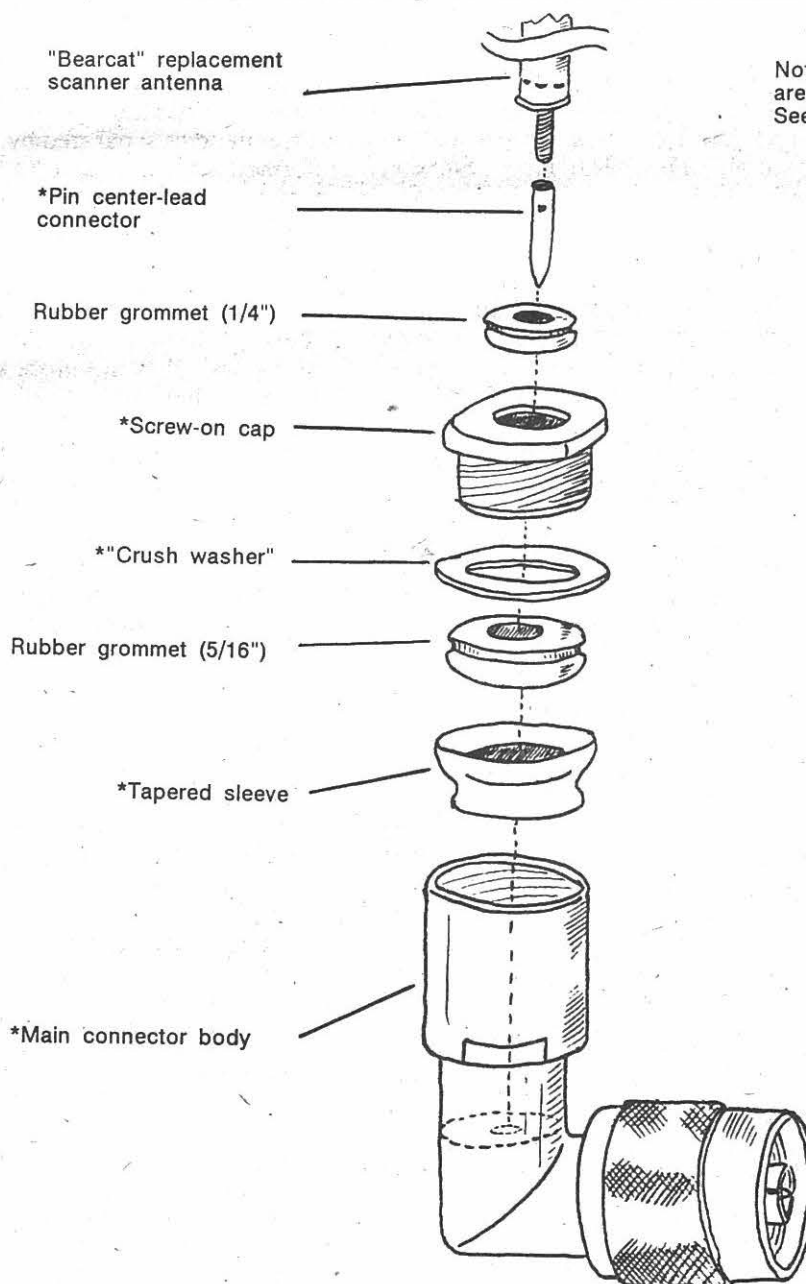
Slide the antenna/pin/grommet assembly down into the connector

body until it seats. Tighten the screw on cap until it is firmly snug and the slide the 1/4" grommet down the antenna into the hole in the cap until it is level with the cap's top and firmly seated.

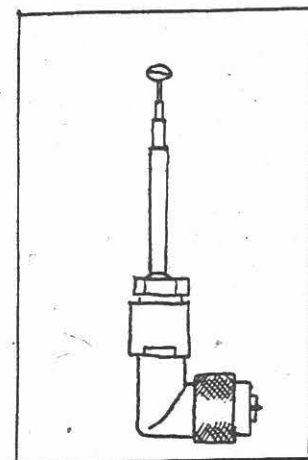
The assembled antenna is now complete. Check it with a ohmmeter to make sure that no part of the antenna are grounded to any part of the outer connector. If you install the antenna on the radio and it does not receive (or receive poorly), re-check the detailed diagram picture against what you did.

Not only is this antenna good looking and strongly constructed, but it only protrudes 1-1/2" out behind the radio. It will not perform like a all-band outdoor antenna, but does as well as commercially-available attachable whips and, by adjusting its length, you can "tune" this antenna to specific bands.

## Detail of Assembly of R-7000 ICOM Back-of-Set Antenna Unit



Note: All parts marked with an asterisk (\*) are INCLUDED with connector "package". See text for details of construction.



The completed, assembled antenna unit

UG-213 90-degree "elbow" connector for large-diameter coax (AMPHENOL # 82-326)

Frequency is exactly as displayed on the R7000. The supplement did not explain how to activate the 1 GHz function, so don't enter anything from 1 GHz and up.

Line 10 sets up the communication protocol at 1200 baud, 8 data bits, no parity, one stop bit, and XON/XOFF disabled. Lines 15 and 16 are data word format strings for the R7000. Lines 20-30 get the memory channel number from the text file, convert it to the necessary format, and send it to the R7000. The text file is named as 2 and the output file (the COM port on the M100) is named as 1. Line 75 checks for a text file end and terminates execution if true.

Lines 35-55 get mode data and send it likewise. Lines 60-74 get the frequency, convert it to R7000 format, and send it next.

The entire loop is repeated for each line of the text file. The hex conversion subroutine is to convert decimal frequency data to hexadecimal data for the R7000. The small 1 to 50 delay loops found in the program slow down the execution so the R7000 will execute the instructions reliably.

Other details are available from the Icom supplement. ■

**Bob Grove, WA4PYQ**

P.O. Box 98  
Brasstown, NC 28902

## Q: R7000/R71A Combo?

Does the JRC NRD525 take the place of both the ICOM R7000 and R71A? (Clifford Legerton, Charles, SC)

**A.** No. It takes the place of the R71A only. The R7000 tunes from 25-2000 MHz, whereas the NRD525 and R71A tune frequencies from .1-30 MHz.

## Q. Why incomplete frequency ranges?

Why do so many programmable scanners have the same (incomplete) frequency ranges? Do they share the same technology and chips? Is one scanner pretty much the same as another? (Leonard Garland, LA, CA)

**A.** Scanner manufacturers copy each other's features which often include frequency ranges. They usually leave out TV and FM broadcasting which accounts for the deletion of 54-108, 174-216 and 512-806 MHz.

216-220 is a little-used inland waterways communications band; 220-225 is presently a ham band (nowhere nearly as busy as the 144-148 MHz two-meter band), and 225-400 MHz is dominated by military air-to-ground communications, generally considered of little interest to most scanner listeners.

While some chips are common among several manufacturers, their frequency-determining microprocessors are proprietary and unshared. Sensitivity and selectivity among the present day desktop scanners are virtually identical even though their circuitry differs.

## Q. Why does scanner lock up?

My Bearcat 201 locks up on several frequencies when a local strong transmitter comes on the air. Do I need a better scanner? (Jason Watkins, Bartlesville, OK)

**A.** Most manufacturers do have high and low end scanners which exhibit different signal handling quality; the BC-201 is not a high end scanner. Generally, low cost scanners do not perform well with outside antennas in metropolitan areas due to strong signal overload.

Plastic cabinets permit the ready intrusion of unwanted radio signals;

interference filters are no longer available from Grove (the last manufacturer) but could be reintroduced if there is evidence of strong demand.

## Q: Why wide filters?

Why do receiver manufacturers insist on providing original filters which are too wide for the majority of listening applications? (John Barkroot, Euclid, OH)

**A.** Competitive cost. Lower cost wide filters sound the "cleanest" since they allow all of the original signal bandwidth to be heard. But when crowded band conditions cause interference, more expensive (optional) narrow filters "trim the fat" off the bandwidth, letting desired signals through while eliminating adjacent interference.

## Q: Large antenna or short whip?

Instead of a large outdoor antenna for shortwave listening, can I get by with a short roof-mounted whip? Do I need a preselector or preamplifier? (Karsten Smedal, Ames, IA)

**A.** Let's take some time with this one. No question arises more frequently at our offices than how to get the best reception for the least antenna. Last month's special antenna review by Larry Magne provides some excellent insights, but let's answer Karsten's questions as concisely as possible.

First, nothing works better or is more efficient than a large antenna. This is a dangerous generalization and it needs some qualifications so as not to be misunderstood.

The assignment for any receiving antenna is to capture as much signal voltage as possible and deliver it efficiently to the accompanying receiver. A large antenna with low-loss transmission line will obviously capture more signal than a small antenna and, if correctly designed, will deliver that signal efficiently to the awaiting receiver.

Years ago, receivers generated considerable circuit noise of their own, interfering with the reception of weak signals. Enormous antennas were recommended to overcome receiver noise.

Modern long-, medium- and shortwave receivers are electrically so quiet that their limiting factor for sensitivity is external noise (natural static and man-made electrical).

Once an antenna has collected enough signal above that noise to be detected, all the amplification in the world will only increase the reception of background noise right along with the signal.

A short whip antenna mounted on a chimney or tree will pick up some signal, but has an efficiency problem due to its short length. Not all of its modest signal will be delivered to the receiver; some will be absorbed by the coaxial feedline. We call this "impedance mismatch".

So we simply put a "signal booster" (preamplifier) on it, right? WRONG! The vast majority of broadband shortwave preamplifiers are easily overloaded by strong signals and, unless they have a tunable preselector which can be adjusted to narrow swaths of spectrum by the listener, the results of their overload frustrates reception.

Signal overload produces intermod (spurious signals heard at multiple places on the dial), desensitization (a general reduction in all signal strengths), excessive images (unwanted spurious signals on frequencies separated by twice the intermediate frequency of the receiver), and may even burn out delicate transistor amplifiers in the preamp or receiver.

In addition, preamplified or "active" antennas introduce circuit noise (hiss), they are more expensive than a passive wire antenna, they are vulnerable to nearby lightning strokes and powerful transmitters, and, if they burn out, the whole system is down.

This may sound like a diatribe against electronic antennas. It is not. Our merchandising arm, Grove Enterprises, sells an effective apartment antenna (The Hidden Antenna System) and there are other small antennas on the market as well. But reserve their use for situations in which the erection of a full-size, passive, outdoor wire antenna is not feasible.

## Q: Use of spectrum display?

What is a spectrum display and how is it used? (Greg Gilber, Marietta, GA)

**A.** A panoramic display is essentially a spectrum analyzer add-on for a receiver. It is an oscilloscope (video) display which represents graphically a swath of radio spectrum reading from left to right.

For example, suppose the horizontal line on the display represents 155-156 MHz; a signal which suddenly comes on the air at 155.5 MHz would make a "pip" or "spike" (bump) on the line right in the center. Other frequencies showing signals would be proportionately placed.

A spectrum display is an extremely useful accessory for "watching" a wide chunk of spectrum for activity while listening to one specific frequency within that spectrum.

## Q: Design formula?

What is the formula for designing an antenna for a particular frequency? (Keith Salmon, Verona, PA)

**A.** Since most antennas are half-wave dipoles (center fed with coaxial cable or twin lead), we use a formula for that configuration. A ground plane antenna is really a half-wave dipole with one leg being the vertical element and the length of the radial skirt being the other leg.

For frequencies below 30 MHz where feet would be a more convenient unit, simply divide the number 482 by the frequency in MHz. For example, an antenna cut for 11.840 MHz would be 40.7 feet in length.

For VHF and UHF, where measurements in inches are more convenient, divide the number 5786 by the frequency in MHz. For example, an antenna cut for 155 MHz would be 37.33 inches in length.

The numbers above are average and theoretical; departures of ten percent or so from the ideal lengths will not cause a detectable difference in reception.

## Q: Can I connect my PRO2004 to a computer?

Is there any way to connect a converter of some sort to my PRO-2004 scanner so that I can control it with a home computer? (William Clark, Cleveland, OH)

**A:** In a word, no. While it is theoretically possible to address the PRO-2004's microprocessor from an external source, no provision is made on this scanner for it to happen. It would require some major circuitry changes. No simple converter or adaptor will accomplish the task.

## Q. How would you compare the Kenwood R5000 to the Icom R71A?

A. Kenwood's intent was to market a receiver better than their own R2000 to compete with the ICOM; they did it with the R5000. Side by side, I can't tell the difference in performance between the two receivers. Both are excellent performers.

To make your choice, examine the functions and styling, deciding which offers you the type of control you like in a receiver as well as the cosmetics. Signal handling capabilities of the two are virtually identical, even when considering the optional filters available from both companies.

## Q. Rubber duckie as good as a whip?

Are there any "rubber duckie" (flex) antennas which perform as well as a longer whip? (Allen Merrett, St. John's, NFLD)

A. No. All short antennas have a smaller aperture (capture area) and, thus, intercept less signal.

## Q. Why do two scanners receive differently?

I have two scanners of different manufacture; one picks up police calls for miles around, while I can only hear very close stations on the other. How come? (BT, Stanford, CT)

A. Are you using identical antennas? Are both antennas in the same position if you are using attachable whips? Try moving them around slightly.

If you live in a mobile home the metal shielding can severely reduce signal levels at the set's whip antenna. If you cannot use an outdoor antenna the scanner should be placed as close to the window as possible.

If you are using an outside antenna, try comparing both sets with the same antenna. If you have two separate antennas, check the poorer one for a shorted cable, broken conductor or a loose or corroded connection.

If the problem seems to be with the scanner, possibly a nearby transmitter or even a lightning stroke could have damaged the delicate "front end" (RF amplifier) transis-

tor(s), requiring a major repair.

Has your scanner ever been aligned? If it was purchased used or if someone has tinkered with its innards, this could be the problem. Send it back to the factory with a complete description of its ailments.

## Q. How can I feed two antennas from one mast?

I would like to mount two antennas, one VHF and the other UHF, on the same mast. How can I

feed them both to my scanner through one cable? (WHM, Johnstown, OH)

A. Quite simply. Visit your nearest Radio Shack or discount store electronics department and purchase a VHF/UHF hybrid splitter--be sure it is specified to work up through 900 MHz. You will also need three F connectors an about ten feet of low-loss coaxial cable (RG-59/U will work just fine).

The hybrid splitter is a bi-

directional device; that is, it has two connectors on one side, one on the other, and can either combine two signals into one output or split one signal line into two outputs (for example, into two scanners).

Avoid splicing two antennas directly without the splitter (or similarly, two antenna leads from two scanners); while no harm will be done, the mismatch is likely to reduce signal strengths and will encourage mutual interference between the scanners ("lockup").

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## What About AM?

I enjoy reading Monitoring Times but wish there was a section on AM "broadcast band" DXing and call-in programs. Also, I would enjoy seeing photos of some of the better known talk hosts and short biographies on how they got their start in radio. An interesting feature would be British talk hosts in America.

Anita McCormick  
Huntington, WV

[On one hand, HCJB denied me my first QSL card because I didn't use UTC in reporting my reception. (I've since gotten over the hurt.) And that goes along with what you're saying. However, Mr. Hill is a DX purist and I believe he was speaking on a philosophical level. I can also document the point he was making; I have several full-data QSL cards from stations that sent them to me in response to a simple letter asking for information on their station for publication -- no reception report included whatsoever. --ed.]

## Still DXing with the Experts

Loved your "DXing with an Expert" interview with Bob Hill. Finally, someone has made it known that QSL cards aren't always proof of reception. Back in 1966 when I first entered the hobby, I collected 6 QSL cards -- just enough to prove to skeptical friends that I could receive radio signals from 6 continents. Now I use a sanyo ST-60 tape deck plugged directly into my modest Panasonic RF-2200 receiver. Not that collecting QSL cards isn't one of the many facets of our beloved hobby. It's just too time consuming and frustrating for some of us.

Gary Fiedler  
Mott, North Dakota

## How to Get on the MT Monitoring Team

I would like to "apply" to be an honorary member for the frequency section of Monitoring Times. I have been doing quite a bit of listening lately and I think it would be a fun experience to try and monitor all of the English language broadcasts.

Kannon Shanmugam  
Lawrence, Kansas

[MT is a reader participation magazine. We welcome your input on frequency information and thank you with a handsome certificate that, in some small way, shows our appreciation. If you notice any changes in the frequency section, simply send them in to coordinator Larry Miller at P.O. Box 691, Thorndale, PA 19372. Incidentally, Kannon is one of the editors for the excellent American Shortwave Listener's club bulletin, "SWL" -- ed.]

## More on Police Call

If I had to put up with the sort of response that the publishers of the Police Call book apparently did with Mr. Larry Dale Anderson [when the post office apparently mistakenly returned his order for insufficient address], I'd tell him to take his business elsewhere. No one needs to suffer that sort of abuse and no, Bob Grove shouldn't have published such a frantic rant in his magazine. Publish every wild accusation and MT will soon become a forum for kooks and crazies.

Bob Gellman  
New York, NY

Stories on tug boats. Race cars. Toot, toot. Beep, beep. What is becoming of Monitoring Times?

Anonymous

## More On South Africa, Part 2?

I'm glad I'm not the only one offended by the injection of high-pressure, left-wing politics into the pages of MT. I have long recognized what Larry Miller is trying to do -- blend leftist political philosophy into otherwise harmless hobby articles. The result, of course, is a subliminal swaying of the readers opinions in favor of his corrupted view of the world. The idea is not new; other communists have been using this ploy for decades.

Anonymous

## Laughing Like the Rest of Us

I once knew a man who was convinced that prolonged use of Xerox machines produced impotence. Then there was the guy who kept telling me that hairdryers caused memory loss. In both cases, it was proximity to electrical equipment that supposedly exerted these disastrous effects. As crazy as the ideas seems, I'm beginning to wonder: could it possibly be that they were right? Could it be, for instance, that proximity to shortwave receivers could cause one to lose one's sense of humor?

Two Letters to the Editor of MT (June, 1987, p.60) scathe me for being resentful of and insulting to, Mr. Miller and of publicly humiliating said Mr. Miller. My offense? A piece entitled, "DXing Like Most of Us," written by me in the May 1987 issue of MT. Well, folks:

The piece wasn't written to insult or publicly humiliate Larry Miller. And no, I'm not resentful of him either. I rather like Larry. And I wish I could do what he can. He's a pro when it comes to DXing, while I'm merely a dilettante. That's precisely what I said in my article. Sure, I did make fun of somebody. Me, that is. But I guess that went right past a couple of MT readers. Maybe they are avid shortwave listeners and -- thus -- often in close proximity to electronic equipment.

Come to think of it though, it can't be that close proximity to shortwave equipment robs you of your sense of humor. Larry Miller, for instance, is in close proximity to shortwave all day long. And here's what he said on

the postcard he mailed me after I submitted that infamous article to him: "Bravo! Great piece!...I laugh every time I read it."

Still, just to be safe, let's all be more careful when we sit next to our shortwave radios. After all, why take chances on losing our memory and sense of humor. And (God forbid), our potency.

Ted Brunner  
Laguna Beach, CA

Boy, what a bunch of stuffy readers! I like Larry Miller's broadcast columns, and I also liked the article: "DXing Like Most of Us" by Theodore Brunner. I thought it was very funny and don't see what's the matter with having a little fun in some of the magazine's articles. Relax. Loosen up. You'll enjoy life more.

Richard Ferch  
Bricktown, NJ

## Political Science 101

I was very offended by the comment on Stewart McBirnie on page 15 of the June issue. If Mr. McBirnie is a right winger then so are most all Americans that love this country. If Americanism is right-wing to you [Mr. Miller] then Marxism must be middle of the road.

Steven Garren  
Winder, GA

[The term "right winger" is a standard, very commonly used term that describes a person or group's political or ideological orientation. It is no more of a denigrating term than "left winger." In any case, a person does not have to subscribe to one political orientation or another to love one's country. Ironically, my friend, the theory that you do is most widely held in communist countries.]

## MT on the Bayou

I wholeheartedly agree with reader Chedville's comments on page 23 of the June, 1987, Monitoring Times. MT does indeed have the flavor of boiled crawfish, however readers should be sure to remove the staples before cooking.

I think that the merger of MT and International Radio has made for a consistently excellent publication.

Walt McCrystal  
Henrietta, NY

## Bob Grove, WA4PYQ

P.O. Box 98  
Brasstown, NC 28902

## THE MIZAR ARTICLE: A DUPE?

Received the February 1987 issue of MT. Imagine my surprise when I turned to page 12 and saw a picture of the USNS Mizar. Having spent two separate sea duty tours on this ship I feel I am qualified to make some comments about the article, "The Censored Ship".

Mizar is a star of the second magnitude in the handle of the Big Dipper. This can be found in any decent dictionary. The author says this is a unique name but realistically most ships have unique names.

Speaking of unique names this Menlo DuPem definitely has a unique one. Perhaps it should be spelled "Dupe 'em" since he does a pretty good job of that in his article!

The "considerable number of antennas, some with interesting designs" are mentioned. The only thing interesting about this is it's not correct--unless you consider a handful of 35' whips, two surface search radar antennas and an RDF loop as being considerable and/or of interesting design. All of these are common aboard ocean-going vessels.

He forgot to mention the weather vane atop the main mast. Maybe it's some top secret antenna instead? I almost forgot to mention the saucer-shaped TV antenna which, I'm sorry to say, is not visible in the picture.

I don't understand how a ship can be involved in oceanographic research and not have "devices for hoisting items over the side." The Mizar's ice breaker bow has nothing to do with her mission. As was stated she was originally a light cargo vessel designed to resupply Antarctica and not, as stated, areas near Alaska.

The author is correct with his "...unlike most USNS ships, is painted white". Most USNS ships are not oceanographic research ships. White is the international color of oceanographic research ships which the author could have learned if he had done some research--oceanographic or otherwise!

The last tag line should have been, "Some Wild Guesses" instead of, "Some Solid Speculations"; in fact it would have been a great title for the entire article. I don't deny Mr. DuPem the right to speculate, but his article is so full of "non-facts" and just plain bologna.

This kind of useless "information" does not belong in a factual and quality publication such as MT. Besides the fact that this article was almost laughable it was good to see

one of my old ships, especially in such an unsuspecting place as MT. I am not faulting MT; it is one of my favorite periodicals, but Mr. DuPem's article rates a 2 on a scale of 1 to 10. Except for the photo, pages 12 and 13 are simply "MT" space.

The accompanying news clip mentioned "annual overhaul". Neither USS nor USNS ships get annual overhauls; it is more like every three years or so. I wonder if Mr. DuPem wrote this also?

K. T. Weber, Jr.  
USNAS, FPO NY

## The Author Replies

I found Mr. Weber's letter most interesting and humorous. Even my friends have never thought of the "dupe'em" bit and I liked the "MT space" play on words. However, let's deal with the serious comments.

Yes, Mizar is in some dictionaries. Of the 500+ ships in the Navy, only a handful have really interesting and unique names. My opinion on the name Mizar is unchanged.

The picture in MT was, naturally, not as clear as the original. I stand by my comment on the antennas and continue to leave the analysis to the readers.

The comment on the hoisting mechanism was just to explain the configuration of the superstructure in simple terms for those unfamiliar with Naval ships. No other significance was intended. Not all readers share Mr. Weber's experience.

While the three ships may have been designed for Antarctic waters, they spent most of their time going between Seattle's Pier 91 (where they and I were stationed at the time!) and Alaska. I know the official reason why Mizar is painted white; I was suggesting it had other advantages, too.

As to the solid "speculation", it is well known that "research" ships are trawling for Soviet subs off the coast of the U.S. and Canada, and off the mouth of 3,000-foot-deep Strait Juan de Fuca with "three-mile-long underwater lines holding sonar equipment." Sound familiar?

I personally saw one of the Russian spy subsurface buoys that broke loose and washed up on the coast at Cape Alva, Washington, in 1983. The Navy grabbed it and took it off, never to be seen again by uncleared civilians like the troop of Boy Scouts who discovered, photographed and reported it.

What is most interesting about Mr. Weber's letter is his failure to discuss

anything substantial regarding the many facts about its history and the PR man's statements. It's hard to do so when the Navy provided all of them over a period of years.

The Mizar is, in fact, a special form of spy ship and counterintelligence platform, a fact which the Navy neither admits nor denies. Neither does Mr. Weber, but he does have a great sense of humor.

P.S. If you want to brief yourself fully on this topic, then read: "Intelligence and Warfare" by William V. Kennedy (1983-Crescent Books) and "Sword and Shield" by Jeffery T. Richelson (1986).

Menlo DuPem

## PHOTO CORRECTION

I just received the June issue of MT. On page 25, under the caption, "A New Antenna at Byron Hill, Illinois", is pictured an "umbrella" structure. This is incorrectly postulated as an antenna. Actually, it is a lightning protection scheme, probably manufactured and installed by Lightning Elimination Associates (12516 Lakeland Rd., Santa Fe Springs, CA 90670). The umbrella is NOT designed to protect radio and antenna installations.

The theory of operation is

simple: The thoroughly-grounded umbrella will draw any lightning strokes away from the protected sensors and instrumentation in its protective shadow. Sensors are also protected individually by MOV and gas-tube shunts, both at the sensor location and again at the bottom of the tower where the signal cables connect to the signal conditioning units.

All power generation plants, fossil-fueled or nuclear, are required by the Environmental Protection Agency (and others) to monitor meteorological and air conditions in real time. Notice the wind direction and wind speed sensor on the crossarm just below the umbrella.

The pictured tower probably has three levels of meteorological instrumentation (two are shown). "Events" have different impacts depending on if they occur at or near ground level, 100 feet or so above ground, or at plume level of 200 feet or higher. The computer models take into account different weather data at varying heights.

Hope this info was useful to you. Keep up the great work with MT!

Bill Cheek, Owner/Engineer,  
Commtronics Engineering

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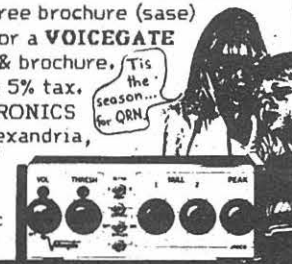
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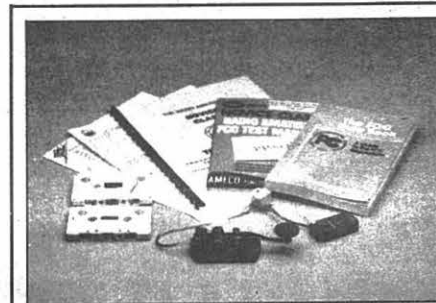


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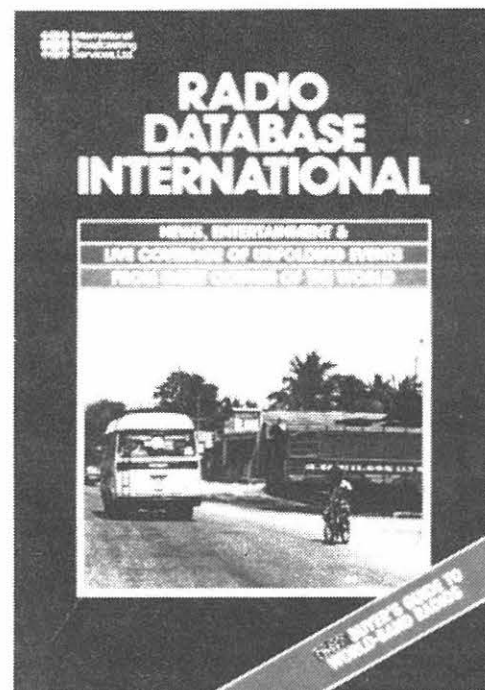


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